Climate Change 2017 - Repsol

Module: Introduction

Page: Introduction

CC0.1

Introduction

Please give a general description and introduction to your organization.

Repsol is international integrated Oil&Gas Company whose main activity consists of the upstream and downstream business. The Company has become firmly established as one of the most important international companies in the O&G industry operating in more than 35 countries and working towards energy solutions which are responsible to the planet.
At Repsol we believe that access to energy is a universal right. Everyone is entitled to economic and sustainable energy sources. Therefore, our obligation is to guarantee a safe and competitive supply while preserving the environment and ensuring a better planet for future generations. We work on solutions that allow society to enjoy a sustainable future with low emissions of greenhouse gases
The Company has a Carbon Strategy aligned with public policies (regarding CO2 emissions and energy efficiency), reduce the carbon footprint in its entire value chain, and committed to technological innovation and to continue promoting greater energy efficiency in our operations. We are also continuously monitoring the latest trends and technologies developed in the field of renewable energy, investing in sustainable mobility, and contributing to the reduction of emissions through biofuel production and research.

The Company is engaged in all aspects of the Oil and Gas business.
Its main business activities include the exploration, development and production, of crude oil and natural gas reserves. Crude oil and gas transport by pipeline or in tankers from the production areas to the consumption areas. Refining crude oil to turn it into value added products such as gasoline and diesel. Marketing such products and liquefied petroleum gas (LPG) via, in each case, the petrol station network and the network for distribution to the end customer. Chemicals, from oil derivatives, which produces and sells a wide variety of products ranging from basic petrochemicals to derivatives. The natural gas regasification and liquid natural gas (LNG) and renewable production projects.
In 2016, Repsol continued the process of transformation begun with the acquisition of Talisman and the approval of the 2016-2020 Strategic Plan
Besides, the Company is involved in generation, transportation, distribution and retailing of electricity. Gas Natural Fenosa is a strategic stake holding in which Repsol has a non-operated participation of 20% (December 31st, 2016). Its main activity is the marketing of natural gas and the generation, distribution and marketing of electricity.

We developed our activities to become an even more sustainable and competitive company, with a responsible commitment to the environment and to the areas in which we operate.
We are decidedly and continuously committed to sustainability as a key factor for creating value, now and in the future.
This is always done using processes that respond to the strict controls on safety and respect for the environment.
We are committed to technological innovation as the key to building a more efficient, secure, competitive and sustainable energy model. This commitment is embodied in the Repsol Technology Center: a leading European center where we promote R&D+i with investment of nearly USD 86 million in 2016.

CC0.2

Reporting Year

Please state the start and end date of the year for which you are reporting data.

The current reporting year is the latest/most recent 12-month period for which data is reported. Enter the dates of this year first.

We request data for more than one reporting period for some emission accounting questions. Please provide data for the three years prior to the current reporting year if you have not provided this information before, or if this is the first time you have answered a CDP information request. (This does not apply if you have been offered and selected the option of answering the shorter questionnaire). If you are going to provide additional years of data, please give the dates of those reporting periods here. Work backwards from the most recent reporting year.

Please enter dates in following format: day(DD)/month(MM)/year(YYYY) (i.e. 31/01/2001).

Enter Periods that will be disclosed
Fri 01 Jan 2016 - Sat 31 Dec 2016

CC0.3
Country list configuration

Please select the countries for which you will be supplying data. If you are responding to the Electric Utilities module, this selection will be carried forward to assist you in completing your response.

Select country

CC0.4
Currency selection

Please select the currency in which you would like to submit your response. All financial information contained in the response should be in this currency.
USD($)

CC0.6
Modules
As part of the request for information on behalf of investors, companies in the electric utility sector, companies in the automobile and auto component manufacturing sector, companies in the oil and gas sector, companies in the information and communications technology sector (ICT) and companies in the food, beverage and tobacco sector (FBT) should complete supplementary questions in addition to the core questionnaire.
If you are in these sector groupings, the corresponding sector modules will not appear among the options of question CC0.6 but will automatically appear in the ORS navigation bar when you save this page. If you want to query your classification, please email respond@cdp.net.
If you have not been presented with a sector module that you consider would be appropriate for your company to answer, please select the module below in CC0.6.

Further Information

Module: Management

Page: CC1. Governance

CC1.1
Where is the highest level of direct responsibility for climate change within your organization?
Board or individual/sub-set of the Board or other committee appointed by the Board

CC1.1a
Please identify the position of the individual or name of the committee with this responsibility
Repsol's Corporate Executive Committee has the highest level of direct responsibility for climate change. The Corporate Executive Committee approves Company's Climate Change Strategy. The positions of the members that compose Repsol's Corporate Executive Committee are:
- Josu Jon Imaz San Miguel, Chief Executive Officer (CEO), Executive Director, Member of the Corporate Executive Committee
- Luis Suárez de Lezo Mantilla, Executive Director of the General Counsel and Secretary of the Board of Directors.
- Miguel Martínez San Martín, Chief Financial Officer (CFO), Member of the Corporate Executive Committee.
- Begoña Elices Garcia, Executive Director of Communication
- Luis Cabra Dueñas, Executive Director of Exploration and Production.

- Antonio Lorenzo Sierra, Corporate Director of Strategy, Control and Resources.
- Maria Victoria Zingoni, Executive Director of Downstream.
- Arturo Gonzalo Aizpiri, Corporate Director of People & Organization.
- Miguel Klingenberg Calvo, Corporate Director of Legal Affairs.

Therefore, strategic decisions on climate change and strategic lines of action are established at the highest level in Repsol's organization hierarchy. In addition to approving the strategic lines of action, the Executive Committee approves the pluri-annual strategic objectives and the annual emission reduction targets linked to meeting these objectives.
In 2015, the Board of Directors set up a Sustainability Committee with the task of analyzing the expectations of the company's stakeholders and reporting these to the Board of Directors, proposing the approval of the strategy and guiding and monitoring the objectives, action plans and practices of the company regarding sustainability.
Half-yearly or as required, the Executive Committee and the Sustainability Committee review the information relative to the execution of Repsol's Climate Change Strategy and CO2 emissions.
The Sustainability Direction develops the Repsol Climate Change Strategy and coordinate all the Business Units involved.

CC1.2
Do you provide incentives for the management of climate change issues, including the attainment of targets?
Yes

CC1.2a
Please provide further details on the incentives provided for the management of climate change issues

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
Corporate executive team	Monetary reward	Emissions reduction target	
Chief Executive Officer (CEO)	Monetary reward	Emissions reduction target	
Chief Financial Officer (CFO)	Monetary reward	Emissions reduction target	
Management group	Monetary reward	Emissions reduction target	
Business unit managers	Monetary reward	Emissions reduction target	
Energy managers	Monetary reward	Emissions reduction target	
Environment/Sustainability managers	Monetary reward	Emissions reduction target	
Facility managers	Monetary reward	Emissions reduction target	
Process operation managers	Monetary reward	Emissions reduction target	
Other: Energy/environment engineers and technical staff	Monetary reward	Emissions reduction target	

Further Information
(Q 1.1a) The positions of the individual and name of committee reflects the organization in the year reported (2016) (Q 1.2a) These targets have a direct impact on our employees with variable compensation. Emissions reduction targets are included in Exploration & Production, Refining and chemical businesses, which represent 99.9% of the global CO2 emissions. From Executive Managing Director to employees within these businesses, Repsol provides annual monetary rewards for the management of climate change issues. In addition, for directors and some employees, Repsol provides also medium term monetary rewards. In 2016, Talisman's assets did not yet have climate change targets, but specific ones have been included in 2017. Repsol is including Legacy Talisman assets in their Energy Efficiency Management, working on searching emission reduction initiatives and evaluating all the opportunities. Integration of all the assets in Repsol management process is in progress.

Page: CC2. Strategy

CC2.1

Please select the option that best describes your risk management procedures with regard to climate change risks and opportunities

Integrated into multi-disciplinary company wide risk management processes

CC2.1a

Please provide further details on your risk management procedures with regard to climate change risks and opportunities

Frequency of monitoring	To whom are results reported?	Geographical areas considered	How far into the future are risks considered?	Comment
Annually	Board or individual/sub-set of the Board or committee appointed by the Board	Climate change risks and opportunities are managed within the framework of our Enterprise Risk Management (ERM) System, which is enterprise-wide and therefore comprises all risks of all activities and geographical areas where the company operates	> 6 years	A strength of our ERM methodology is that it allows us the analysis of any given risk, or any given set of risks, at any given moment in the future. We report risk severity and/or loss for each of the following 5 years and for the subsequent years as well. With this approach, we are able to analyse emerging long term risks that are not expected to affect our objectives in the coming years.

CC2.1b

Please describe how your risk and opportunity identification processes are applied at both company and asset level

We use a bottom-up approach in order to build the Repsol Risk Map. At the beginning of this process, the business and corporate units that manage risk-exposing assets or activities examine the changes that have happened during the last year, and they assess how these changes have modified the internal and external business context. Based on the results of this context analysis, they identify and define their risks (and opportunities, as many risks have both a downside and an upside). In order to guide the context analysis and the risk identification process, they use a common corporate overarching taxonomy that prevents the units from omitting any relevant risk. Once the business units have defined their risks, they apply a risk analysis methodology which combines both quantitative techniques for the analysis of frequencies and economic losses, and qualitative techniques for the analysis of impacts on reputation and people. The quantitative techniques enable the organization to depict the whole probability distribution of losses of any given risk, through Monte Carlo simulations. Once the Risk Map of each business and corporate unit has been built (asset level), they are aggregated in order to build the Repsol Risk Map (company level).
Climate change can trigger many different risk events of our risk taxonomy, among others:
-Wars, armed conflicts and social instability
-Deterioration (or improvement) of competitive position
-Regulatory changes
-Media manipulation/activism
-Inadequate investment/divestment decisions
-Technological obsolescence due to the appearance of disruptive technologies
-Epidemics, plagues or similar outbreaks
-Extreme weather events, non-predictable weather changes and natural disasters
Any of these events can hamper the adequate execution of the business processes of the Company, and ultimately the achievement of its strategic goals. That’s why climate change is a risk and opportunity factor we consider throughout the whole ERM process.

CC2.1c

How do you prioritize the risks and opportunities identified?

According to Repsol’s ERM process, once each business or corporate unit has produced its risk map, it is reported to its managers. This report comprises both the risk profile and the state of the controls that mitigate the risks, as well as the improvement potential of such controls. With this information available, the managers can make decisions on the controls to be implemented or improved, and allocate resources accordingly. In order to guide them when making these decisions, Repsol has risk appetite statements for those risks that the Company is not willing to assume. These statements are contained in the specific policies and norms that regulate the management of those risks. Therefore the management systems of these “zero appetite” risks promote the continuous improvement of our performance, regardless their severity. Reputation & brand, HSE, security, ethics & conduct and compliance risks are examples of “zero appetite” risks. The rest of the risks, i.e., those which the company is willing to assume up to a certain threshold, are compared with each other in terms of their severity; a risk map is in fact a risk ranking where different risks that have been measured with a common metric are compared with each other
The next milestone of the ERM process is the aggregation of the individual risk maps to produce the Company-wide Risk Map. Once this has been completed, specific reports are prepared for the corporate units that supervise the management of specific risks so that they can make decisions as well, with the guidance of the same principles regarding risk appetite. Examples of these reports are the maps of legal, reputational, HSE, security, IT, procurement, compliance, fiscal and financial risks
The Repsol Risk Map, which is reported to the Board, as well as the stochastic simulations and deterministic scenarios of the P&L, are made available for the optimization of key decision-making processes such as the development of the strategic plan and the budget

CC2.2

Is climate change integrated into your business strategy?

Yes

CC2.2a

Please describe the process of how climate change is integrated into your business strategy and any outcomes of this process

I)Our Business Strategy (BS) is a 5-year plan reviewed annually. We perform internal & external analysis of current and future situation. Annually we consider climate change risks&opportunities (R&O) which impacts on the strategic lines and affects our competitiveness. Our Carbon Strategy provides inputs to business strategies on how to manage these R&O (e.g.carbon footprint reduction, energy efficiency improvements, venting & flaring reduction, ETS development). 3 divisions play a key role: Sustainability, Emerging Business and Research&Development (R&D). All inputs come from all Business Units and are coordinated by Strategy Division to feed the BS annual revision
II)Our Strategic Plan 2016-2020 considered a fewer emissions world. The most efficient solution to a transition to a low emission future is the gas natural. We are a gassy company, 75% of our proved reserves are gas
Our adhesion to Oil & Gas Climate Initiative (OGCI) to collaborate on climate action, sharing best practices and technological solutions is other example. The most relevant fact in 2016 has been our adhesion to OGCI Climate Investment (OGCI CI), a fund to invest $1 billion over 10 years to develop and accelerate the deployment of low-emission technologies. We also endorsed Zero Routine Flaring by 2030 World Bank Initiative that brings together governments, O&G companies and development institutions to eliminate routine flaring by 2030. We also endorsed the Climate and Clean Air Coalition Oil&Gas Methane Partnership initiative that provides companies with a mechanism to address their CH4 emissions and demonstrate this systematic approach and its results to stakeholders
III)In the short term our strategy is influenced by following all the regulatory changes on climate aspects that can affect our business. After COP21,NDCs will have an impact on climate policies. We operate in areas with strict energy and carbon legislative requirements (about 60% of our direct CO2 emissions come from European, US and Canadian assets). Our strategy includes suitable measures to diminish the risks and reduce compliance cost. In Europe the current 2020 energy&climate package is associated to a number of directives (e.g.Energy Efficiency Directive and the ETS). A 2030 energy & climate package was delivered and new directives are under discussion. In US there are regulations on national CH4 emissions plan. In Canada it is the implementation of climate legislation. Our strategy is focus on increasing our resilience against these regulatory frameworks
In the medium term we invest in R&D and Energy Venture projects and we will continue doing it in the future. OGCI CI is an additional effort. We will continue investing in low emissions projects and technologies and collaborate with OGCI companies to get synergies and successful results. Energy Ventures investments are around 10 M$/year and R&D investments around 15 M$/year
Investing in clean energies implies thinking about the costs, maturity or technologies that finally will be succeeded in. These points are relevant for society that needs affordable energy and for the energy companies to be sustainable in future. We face a puzzle to reach a 2DS. We can identify 3 common elements: improving energy efficiency and saving energy; reducing emissions from power generation and deployment alternative low emission options in end-use sectors. We are seeking new opportunities in these areas worldwide and through our business units

IV)Climate aspects that mostly influence our short term business strategy is competitiveness (energy and CO2 costs), and regulatory framework. Implementing a carbon pricing to test base economics for investments decisions is a key component to ensure our portfolio is resilient to external CO2 regulations and policies
We set annual emissions reductions targets linked to a strategic long term objective to promote the development of new Energy Efficiency and emission reduction activities. The annual reduction target was 220ktCO2e for 2016 and it was exceeded achieving a reduction of 314ktCO2e, thanks to energy unit integration projects; steam consumption optimization; isolation improvements; furnace modifications; installation of variable speed motors and actions to reduce the flared and vented gas
V)Long term Business Strategy is influenced by the aforementioned factors and:
Our target for the 2020 horizon: GHG emissions reduction plan includes actions to avoid 1.9 million of tons of GHG emissions annual run rate by 2020
We identify new business opportunities: bioenergy, alternative energies or mobility. Our long-term vision includes a commitment to technological development, intensifying R&D projects focused on Climate Change
Carbon Capture, Use and Storage (CCUS) will be crucial to achieve the Paris Agreement goals. It is the only one capable of substantially reducing GHG emissions from fossil fuels
VI)We are a signatory of the Paris Pledge for Action and we support the agreement. This challenging ambition will require innovation and technology. Our business strategy is focus on:
-Continuing working on energy efficiency
-Promoting the role of natural gas in the world energy mix
-Investing in alternative energies, and increasing their technological maturity to be competitive
-Technological innovation to deepen in CCUS
VII)Our Business Strategy envisages increasing the unit's profits through operational excellence, efficiency and exploiting high-value options for growth with reduced capital needs. Reducing energy intensity and GHG emissions allows us to gain strategic advantage over competitors. We work on energy and emissions cost minimization. Our activities in 2nd generation biofuels and mobility will provide among others a strategic advantage in supplying energy in the future
Natural gas demand will increase as clean fuel compared with coal, specifically in power generation. To switch fuels (natural gas instead of coal) represents a big opportunity for us to have large scale CO2 reductions (75% of our proved reserves are gas, a value much higher than sector average)
VIII) O&G sector is currently trying to understand 2DC challenge. Firstly it is to model energy systems and its future behavior. It is a crucial tool when considering how we meet the challenges facing our energy system in terms of mitigating climate change and providing energy for a growing global population. These models are used to develop scenarios which show how energy demand will change over time, how fast supply technologies may change and the implications in terms of CO2 emissions
We are facing this challenge participating in working groups to explore those scenarios (Low Emissions Pathway in IPIECA and Low Emissions Opportunities in OGCI). The final aim is to identify the most effective levers for O&G companies to deliver this goal collectively and transform ourselves individually
Our strategy department uses those scenarios in order to elaborate our long term strategy

CC2.2c
Does your company use an internal price on carbon?
Yes

CC2.2d
Please provide details and examples of how your company uses an internal price on carbon
i) Scope that the emissions pertain to (i.e. Scope 1, Scope 2 and/or Scope 3)
The company uses an internal price of carbon with the aim to reduce our scope 1 and scope 2 emissions.

ii) Where and how the price(s) is used internally
We apply an internal carbon price in all assets.

iii) Rationale for employing a price
Repsol supports carbon pricing as a policy framework that will contribute to provide our businesses with a clear roadmap for future investment. We believe carbon pricing

encourages the most efficient ways of reducing emissions widely and increases investment in low carbon technologies.
On the other hand, to be effective carbon pricing should be embedded in a coherent policy framework which safeguards a sector's international competitiveness. If governments act to price carbon, this discourages high carbon options and encourages the most efficient ways of reducing emissions widely, including reduced demand for the most carbon intensive fossil fuels, greater energy efficiency, switching the use of natural gas instead of coal, increased investment in carbon capture and storage, renewable energy, smart buildings and grids, cleaner cars and new mobility business models and behaviors.
More precisely in our company, establishing an internal carbon pricing to evaluate investments, both in new projects or in modifications made to existing operations, helps us in our decision-making processes and allows us to demonstrate our stakeholders that we manage climate change risks adequately. Additionally, carbon pricing helps us determine our investments resilience to energy and climate policies future costs, such as taxes or emissions trading schemes, and boost an efficient energy design from an early stage.

iv) Actual price(s) used and variance (e.g. by time or region, or by the way it is used across the business or in specific business units or corporate divisions)

Our carbon price pathway starts with 15 USD$/t CO2 and this value will increase in the future. The aim is to reach 40 USD$/t CO2 by the middle of the coming decade.

v) Process to determine price(s) and business division responsible
The carbon price pathway is elaborated by the Strategy Division in collaboration with the Corporate Energy and Carbon Unit (included in Sustainability Division) and is sent to the business units to be included by projects leaders in their economics.

vi) Examples of how carbon pricing has affected your business (e.g. business strategy, risk assessment or evaluation, emissions reduction, investment decisions)
At Repsol, we take the price of carbon into account for our strategic plans. This way, we prepare our company to a low emissions future defining a Corporate Carbon Pricing.
The price of carbon is used to test base economics for investment decisions, ensuring that our portfolio is resilient to external CO2 regulations and policies, encouraging energy efficiency and low carbon technologies. CO2 price is also considered in risk management procedures of Business Units since new legislative developments could increase operational costs.
That is to say, Carbon Pricing has influence and drives technology choices and has had some influence around various design elements throughout the project life cycle.
An example of the importance of considering the CO2 price is the climate target setting by Repsol in order to mitigate that risk. The Company has set a new target for the 2020 horizon: the reduction of 1.9 million tonnes of CO2e in the period 2014-2020, which provides continuity to the CO2e reduction plan initiated in 2005.

vii) Challenges with this process
The main challenge will be establish a global carbon market. Although this aspect was not agreed at the United Nations Conference on Climate Change, we believe carbon pricing is the most effective way to reduce GHG emissions.
All the transformations that must take place in the energy sector, require clear, stable and predictable regulations over time. We believe that a carbon price of global reach, extended to all sectors and worldwide, is a key factor in policies to mitigate climate change with the least cost to society, which encourages innovative technologies compatible with the 2ºC scenario. In addition, a carbon price included in the final cost of all products, regardless of where they are produced, gives a clear incentive for the most efficient companies to reduce their emissions.

CC2.3
Do you engage in activities that could either directly or indirectly influence public policy on climate change through any of the following? (tick all that apply)
Direct engagement with policy makers
Trade associations
Funding research organizations
Other

CC2.3a
On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
Mandatory carbon reporting	Support	We support legislators and policy makers on the European Union directive on disclosure of non-financial and diversity information. The Directive 2014/95/EU on disclosure of non-financial and diversity information by certain large undertakings and groups amends the Accounting Directive 2013/34/EU. It requires companies concerned to disclose in their company reports, information on policies, risks and outcomes as regards environmental matters, social and employee aspects, respect for human rights, anticorruption and bribery issues, and diversity in their board of directors. This will provide investors and other stakeholders with a more comprehensive picture of a company's performance. We have responded to European Commission Consultation "Public consultation on non-binding guidelines on methodology for reporting non-financial information" Repsol reports already all the information required by the directive in its 2016 Consolidated Management Report and 2016 Sustainability Report. The 2016 Repsol Sustainability Report has been produced in accordance with the Global Reporting Initiative Sustainability Reporting Guidelines, version GRI G4, including the sector supplement for oil and gas companies, in accordance comprehensive. The Report also meets the criteria of AA1000 AS 2008 standard of inclusiveness, materiality and responsiveness, and it has been verified under the AA1000 AS 2008 standard. Scope: European Union	We support the EU legislation on mandatory carbon reporting. These requirements involve significant efforts to adjust our current reporting processes, but at the same time represent a great opportunity to increase transparency and confidence of society, investors and regulators in our company. Repsol reports already all the information required by the directive.
Cap and trade	Support with minor exceptions	We have been directly involved with the policy makers in the discussions about the Commission proposal on the Emissions Trading System (ETS) Reform. The ETS reform must ensure compliance with the objective of reducing GHG by 2030, while ensuring adequate protection for European industry to compete in global markets and therefore, at risk of carbon leakage and investments. Likewise, we have shared our messages with trade associations such as BusinesssEurope, FuelsEurope. Scope: European Union	Regarding the Commission proposal on the ETS Reform, we believe EU ETS should remain as the cornerstone of climate policies in the EU. A modified ETS must therefore provide the right incentives towards a competitive low-carbon economy. The ETS Reform should support industrial competitiveness, guarantee security of supply and assure sustainability. The new framework must balance the efforts and reinforce competitiveness as a fundamental element to support growth and jobs. In the absence of a global agreement on climate change that includes all major contaminant countries, the risk of carbon leakage is critical and harms European Union industry, while discourages new industrial investments.
Energy efficiency	Support with major exceptions	We have responded to European Commission "Consultation on the Review of Directive 2012/27/EU on Energy Efficiency". We also have indirectly sent a letter through IOGP on energy efficiency to DG ENERGY in order to emphasize our position and the importance of one GHG target. Scope: European Union	Repsol supports one target-approach, the single GHG reduction target for 2030, as the most cost-efficient way to the low-carbon society using energy efficiency and use of renewable energy. The European Union should ensure that all the pieces of its energy and climate policy form a coherent whole in order to avoid a distorting effect on the carbon price. The main focus of the

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
			future climate policy should be on GHG emissions reduction rather than on setting specific targets for energy mix and energy efficiency. If European Union member states set energy efficiency targets those should be expressed as an absolute level of primary energy consumption or GHG emission reductions rather than focus on final energy. Industrial sectors should not be obliged parties of the energy efficiency directive post- 2020 as they have ETS to reduce GHG emissions trough Energy efficiency and renewable sources
Clean energy generation	Support with minor exceptions	We have been directly involved with the policy makers in the discussions about European Strategy for a Low Emission Mobility and the Commission proposal on the Renewables Energy Directive Reform (RED II). In October 2016 Repsol organized the second annual "Energy for Europe" conference with the participation of European Commission Director-General for Climate Action Mr. Jos Delbeke and Director-General for Energy Mr. Dominique Ristori. In attendance were more than 150 participants from European institutions, industry, and civil society. Participants were invited to answer questions on crucial topics including: What is needed to deliver on the COP21 Agreement, both from a policy and from a market perspective? How can the energy sector contribute to a more sustainable transport? What role will renewable play? Scope: European Union	Repsol welcomes the Commission's proposal on the Renewable Energy Directive II (RED II) as the policy instrument to promote the use of renewable energy in the electricity, heating & cooling and the transport sector and recognizes that the deployment of renewable energy is one of the main measures to tackle security of supply and climate change. Repsol considers that transport can play an important role in achieving the EU-wide renewable energy target of at least 27% renewables in 2030. Homogeneous policy across the EU will be key in creating conditions that remain predictable and stable over the long term and that prevent fragmentation of the EU single energy market
Climate finance	Support	We answered the public Commission stakeholder consultation "Interim evaluation of Horizon 2020" aimed to collect information from a wide audience on different aspects of Horizon 2020 implementation. Scope: European Union	The main reasons for participating in Horizon 2020 are minimize risks, sharing knowledge and collaborate with the best. If the EU support to research and innovation (Horizon 2020 and its possible successor) were to be discontinued, the direct impact wouldn't be so high at first sight but would be more difficult to work with academia and other companies sharing risks.
Regulation of methane emissions	Support	We have established contact with some members of the European Union institutions regarding the National Emissions Ceiling Directive, which initially included methane emissions into its scope. Scope: European Union In addition, Repsol also engaged directly with Federal policy makers regarding proposed Methane regulations. This engagement was through our membership in Canadian Association of Petroleum Producers (CAPP) but the discussions were held directly with the individuals at Environment and Climate Change Canada	On 31 December 2016 entered into force the new National Emission Ceilings Directive which sets maximum emission ceilings for five pollutants: fine particulate matter (PM2.5), sulphur dioxide, nitrogen oxides, non-methane volatile organic compounds, and ammonia. In the original proposal, methane emissions were included in the Directive but finally methane was left out of the scope. In any case, the Commission will continue to monitor these emissions and their effect on ambient air quality and will consider measures for reducing those emissions, and where appropriate, submit a legislative proposal to that purpose. In its assessment, the Commission will take into account a number of ongoing studies in the field, due to be finalized in 2017, and international developments in the matter. Repsol supports the identification of sources, the measurement and the mitigation of methane

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
			emissions, avoiding any legislation which may lead to double regulation or duplicities. In this sense, Repsol is fully committed to mitigate its methane emissions and has recently endorsed the Climate and Clean Air Coalition Initiative – Oil and Gas Methane Partnership promoted by UN Environment

CC2.3b

Are you on the Board of any trade associations or provide funding beyond membership?

Yes

CC2.3c

Please enter the details of those trade associations that are likely to take a position on climate change legislation

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
International Emissions Trading Association (IETA)	Consistent	In Europe, IETA supports the EU emissions trading system (ETS) as the central policy instrument of the 2030 Climate and Energy package. IETA highlights the importance of efficient functioning of the market, with predictable rules, greater policy coordination and appropriate measures to address ETS impacts on trade-exposed sectors. One of its priorities is to form a vision on longer-term strategic issues, such as extending the scope of the ETS, investment incentives for low-carbon technologies and use of markets to meet the European Union's rising ambitions.	During 2016, Repsol has participated in the EU ETS Working Group, the Extending the scope of the EU ETS to new sectors, EU Working Group and in the Overlapping Policies and Carbon Leakage Post 2020 Task Forces.
FuelsEurope	Consistent	FuelsEurope recognizes that climate change is real and warrants action towards a global challenge. To address a global challenge global actions are required. These measures should however be compatible with the need to supply energy to a growing world population. Increasing volumes of energy – secure, reliable and affordable - are necessary to fight poverty in several regions of the world, to permit access to higher living standards to a rising middle class in many developing countries and to maintain today's life quality in the developed countries. FuelsEurope believes that the EU refining industry, thanks to its long record of operations and innovations in the field of energy and climate, can contribute to effectively address this dilemma.	Repsol is member of the board and participates actively in several working groups of the association related with EU Emission Trade System, Transport, etc.
International Association of Oil and Gas Producers (IOGP)	Consistent	IOGP recognizes the risks of climate change due to rising greenhouse gas emissions. These result from the world's fast growing requirements for energy driven by industrial and economic growth. IOGP supports the international community's commitment to address the global challenge of	Repsol participates in the EU Committee which is the one directly dealing with European legislation and engaging European regulators. Under the EU Committee there are also many Sub Committees and Task Forces in which we are also involved. The special interest for

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
		climate change and also believes that the oil and gas industry is very much a part of the solution to this challenge and that it can be addressed while meeting society's future energy needs. IOGP believes that the long term objective of climate change policy should be to reduce the risk of serious impacts on society and ecosystems, while recognizing the importance of reliable and affordable energy to society.	this project is the Energy and Climate Subcommittee reviewing the Climate Change policy. We collaborate with the position participating in the Conference calls, face to face meetings, reviewing and making comments to position papers
PlasticsEurope	Consistent	PlasticsEurope is one of the leading industrial trade associations in Europe. It gathers more than 100 member companies, which produce over 90% of all polymers across the EU28 member states plus Norway, Switzerland and Turkey. Plastics Europe promotes the positive contributions of plastics by communicating plastics contribution to sustainable development, innovation and quality of life. It highlights the material's beneficial properties and its positive contributions to society throughout its life cycle, including the fact the European plastics industry makes a significant contribution to the welfare by facilitating resource efficiency and climate protection: Not only most plastics products require less energy in their production than alternative materials but many of them also contribute to saving a significant amount of energy during their use (lightweight materials for transport, insulation for building and construction, energy savings in packaging, etc). Plastics Europe promotes the use of Life Cycle Thinking (LCT) to improve understanding about product benefits and to take more informed decisions. As a scientific method, Life Cycle Assessment (LCA) is a technique to analyze the potential environmental impacts associated with a product, process or service.	Repsol participates in several working groups and task forces such as Life Cycle Task Force, among others. This group is developing eco profiles that are Life Cycle Inventory datasets (LCI) and Environmental Product Declarations (EPD) for plastics. Repsol is also collaborating with Plastics Europe to implement Circular Economy concepts and approach on what regards plastic materials.
CEFIC	Consistent	CEFIC is one of the leading industrial trade associations in Europe, and acts as the voice of the chemical industry in Europe. It represents 29,000 large, medium and small chemical companies in Europe, which directly provide 1.2 million jobs and account for 17% of world chemical production. The chemical industry is committed to contributing to the agreed EU targets of reducing greenhouse gas emissions, including the Clean Energy Package proposal of the European Union and its ambitions to reform and harmonise energy markets in Europe and to pioneer the low-carbon economy for the benefit of all its citizens. In December 2015, the European Chemical Council publically backed the Paris Climate	Repsol participates in several working groups and task forces such as Energy & Climate Change SIG, among others.

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
		Agreements with their strong global commitments, and applauded the diplomatic efforts to achieve an ambitious and globally-binding agreement, as stated again on their most recent press release in June 1st 2017. With the strong belief that the EU chemical industry is a pillar for tomorrow's low carbon economy, the association reminds that Chemical innovations enable current and future climate change solutions, including renewable energy, energy storage and thousands of products to improve energy efficiency, such as in vehicles and buildings	
BusinessEurope	Consistent	Climate change is a global challenge that requires global actions. BUSINESSEUROPE is committed to and aware of the challenges that climate change presents as well as the impacts of human activities. This is why they firmly expect an ambitious legally binding global agreement, which reflects the long-term objective of limiting global warming below 2°C. Development of a global carbon market should play a stronger role in the future. Economic instruments can best help to stimulate investment in innovative low-carbon technologies and products in locations where they deliver the greatest possible climate benefits at the lowest costs.	Repsol participates in several working groups such as Environment and Climate Action Working Group, the Environment Working Group, the BusinessEurope's Advisory and Support Group.
Canadian Association of Petroleum Producers (CAPP)	Consistent	Canada's oil and natural gas sector believes climate change is an important issue to address - globally and within Canada. The industry is ready and willing to do its part to contribute to the overall Canadian plan on climate change. CAPP's policy position on climate change is rooted in the following policy principles: 1) Balance: Balanced "3E" policy should deliver Economic growth, Environmental protection, and a secure and reliable Energy supply; 2) Efficiency: Policy should be designed to drive efficient actions required to achieve emission objectives; 3) Technology: Policy should stimulate investment in the technologies necessary for significant reductions in GHG emissions in Canada; 4) Predictability and stability: Predictable policy built on stable principles should support long term capital investments in the upstream sector and create jobs; 5) Competitiveness: Policy should maintain competitiveness of Canadian industry, ensure compatibility with major trading and economic partners and compliance should be achievable within the context of growing production: 6) Distributional fairness: Policy should distribute cost burden equitably among sectors and jurisdictions across the economy; 7) Harmonization: Policy should be harmonized across jurisdictions within	Repsol participated in the development of policy positions at CAPP. Repsol's employees are participating in various committees and working groups, several of which are responsible for developing positions on policies and influencing emerging legislations or changes to legislation and regulations related to climate change, carbon price, energy efficiency and methane emission reductions.

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
		Canada, to an extent that is both reasonable and practical, and 8) Administrative simplicity: Policy should be simple and minimize the administrative burden on industry to the greatest extent possible.	
Canadian Chamber of Commerce	Consistent	The Canadian Chamber of Commerce supports evidence-based policymaking that appropriately accounts for environmental externalities as well as efforts by the government of Canada to cooperate with provinces and territories to address environmental issues that are of shared jurisdiction. The Chamber favors a price on carbon, supports the creation of a water strategy and believes in the imperative to foster technological innovation and ensure efficient regulatory processes.	Repsol participated in the Chamber's committee on natural resources and, which is in charge of the development of the Chamber's policy positions on climate change.

CC2.3d

Do you publicly disclose a list of all the research organizations that you fund?

No

CC2.3e

Please provide details of the other engagement activities that you undertake

Repsol has been a part of the Oil and Gas Climate Initiative (OGCI) along with nine other leading sector companies to collaborate on climate action since 2015, sharing best practices and technological solutions. In 2016 a fund was created to invest US$1 billion over 10 years to develop and accelerate the commercial deployment of low-emission technologies. The recently created fund will invest in the development of innovative technologies that, once marketed, will contribute in the future to significantly reducing GHG emissions. It will also work jointly with similar initiatives from other sectors and stakeholders. The two areas on which the activity of the OGCI investment vehicle will focus in principle will be the development and implementation of technologies for capturing, utilizing, and storing carbon; and the reduction of methane emissions throughout the value chain to promote the role of natural gas as a fuel for generating electricity.

OGCI is a voluntary, CEO-led initiative, which supply a fifth of world oil and gas production and nearly 10% of the world's energy. The main lines of work are as follows:

• Establish the road map towards a low-emission future: we are researching the areas where the Oil & Gas sector can work to achieve the objective of limiting the increase in global temperature to 2 ºC.
• Manage methane emissions: we are collaborating in the research required to gain in-depth knowledge of methane emissions and detection technology to help both companies and governments to act with greater effectiveness.
• Carbon Capture, Utilization, and Storage (CCUS): the large-scale use of this technology will make us reduce costs, develop viable market mechanisms, and improve our understanding of geological storage capacity.
• Energy efficiency and energy efficiency in transport have started their activities recently. In those activity lines O&G industry can play a relevant role and influence due to its expertise and background over time.

In 2016 Repsol joined the UN Environment's Climate & Clean Air Coalition – Oil & Gas Methane Partnership, to implement methane emission reduction projects in collaboration

with other companies, institutions and governments. We seek to eliminate barriers and come up with technical and economically viable solutions. Repsol also joined the World Bank's Zero Routine Flaring by 2030 initiative, which allows us to collaborate with other companies and institutions to look for the most advanced technologies that minimize the routine gas flaring by 2030.

II Energy for Europe Conference:
On Thursday 29 September 2016, Repsol organised the II Annual Repsol Conference in Brussels entitled "Energy for Europe – Integrated solutions to global challenges". The Conference attracted European Commission officials, Members of the European Parliament and advisors, and stakeholders from industry and civil society.

Antonio Brufau, Chairman of Repsol, opened the conference. He underlined the oil and gas sector's commitment to emissions reduction through efficiency improvement and the importance of the creation of a global level playing field in the fight against climate change. Keynote speakers and two panel discussions looked at the progress made since the signature of the Paris Climate Agreement at the COP21, as well as on the potential of the energy sector in addressing the climate impact of the European transport.

CC2.3f
What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?
The Sustainability Division of Repsol has responsibilities for developing a corporate carbon strategy. At the same time, Repsol establishes internal working groups to follow policy and regulation that may affect the company and also to coordinate the engagement activities that are undertaken related to these policies regulations.
These groups create legislative records to summarize the status of every legislative proposal and regulation that could affect Repsol. The possible impacts and common position of the company are outlined in those documents, so that they can be used by all employees involved in the process. This is to ensure proper coordination of the regulatory activities of the company. The members of these groups are also participants in trade associations. They share the information they receive from the trade associations along with the association's position and activities with the rest of the members of the group. The members of these groups are also the experts on areas affected by a specific regulation as well as some members from the Sustainability Division if the regulation is related to climate change and from the European Affairs Division if it comes from the European Union.

The internal working groups arrange team meetings regularly, which guarantee proper coordination among team members and across the company.

CANADA:
The Institutional Relations Direction has accountability for engagements with policymakers in Canada and is committed to perform Repsol's engagement on the climate policy consistent with Repsol's corporate strategy and overall corporate position on carbon price and climate change. In coordination with the Canadian Business Unit, both teams collaborate to ensure alignment between federal and provincial work on these policies.

Further Information

Page: CC3. Targets and Initiatives

CC3.1
Did you have an emissions reduction or renewable energy consumption or production target that was active (ongoing or reached completion) in the reporting year?
Absolute target

CC3.1a
Please provide details of your absolute target

ID	Scope	% of emissions in scope	% reduction from base year	Base year	Base year emissions covered by target (metric tonnes CO2e)	Target year	Is this a science-based target?	Comment
Abs1	Scope 1+2 (location-based)	100%	13.9%	2010	13662231	2020	No, but we anticipate setting one in the next 2 years	Our decision taking and lines of action on climate change is performed at the highest hierarchical level within the company. The Executive Committee and the Sustainability Committee have the task of proposing the approval of the strategy and guiding and monitoring the objectives, action plans and practices of the company on sustainability, including the climate change issues. In 2013, our 2006-2013 reduction target of 2.5 million tons of CO2e was achieved. We far exceeded the goal set, reaching a reduction of 3.1 million tons at the end of the period. The company has set a new target for the 2020 horizon: the reduction of 1.9 million ton of CO2e in the period 2014–2020, using 2010 base line activity as a reference. Since 2014 we have driven actions which reduced CO2e by 1.2 millions of tons. Annually, and linked to our strategic long term objective, Repsol sets energy efficiency and CO2 reduction plans in all units. The annual reduction target for 2016 was 220,000 tons of CO2e. It was exceeded reaching 314,000 tons of CO2e. We anticipate setting a science based target in the next 2 years. The appropriate methodology to calculate a science based target (SBT) for the O&G sector has not been defined yet. We are already working on it through our participation in IPIECA and OGCI, but we will need also the help and collaboration of CDP, UN Global Compact or World Resources Institute, among others, to define the final O&G methodology to use. It's important to highlight that Repsol recognises the ambition to limit global average temperature rise to 2 ºC and that the existing trend of the world's net GHG emissions is not consistent with this ambition. In May 2015, Repsol acquired Talisman Energy Inc. The based year emissions including 2016 Talisman GHG emissions are 24,866,000 tCO2. Currently, Repsol is including Legacy Talisman assets in their Energy Efficiency Management, working on searching emission reduction initiatives and evaluating all the opportunities. Integration of all the assets in Repsol Management process is in progress. A high degree of ambition of the target set is being a catalyst for the company innovation.

CC3.1e
For all of your targets, please provide details on the progress made in the reporting year

ID	% complete (time)	% complete (emissions or renewable energy)	Comment
Abs1	43%	64%	During 2016, we reduced our emissions by 314,000 tons CO2e through specific energy saving and fuel switching actions. This reduction is substantially greater than the objective established for the year (220,000 tons). The reduction in CO2e achieved during the year was a result of more than 250 investment and operating improvement actions taken throughout Repsol's operations. 254,000 tons of CO2 were reduced in the refineries, 49,000 tons of CO2 in chemical facilities, 9,000 tons of CO2 in E&P assets and 2,000 t in other areas. More than USD 58 million has been invested in 2016 to achieve this reduction. With this reduction, in just 3 years we have reached the 64% of the Company reduction target of 1.9 million tons of CO2e in the period 2014-2020 compared to 2010 base line. This achievement is the result of the commitment of the entire organization to improve energy efficiency and GHG emission reductions. The reduction in tCO2e comes from investment actions and operational improvements across all the Company's operations. These actions mainly include improvements in energy efficiency through projects such as energy unit integration, steam consumption optimization, improvements in isolation, furnace modifications, residual heat recovery and technological updating of the equipment, among others. We have already invested USD 394 Millions in reduction actions, out of USD 550 Millions committed until 2020. In order to formalize the company's vision and energy policy, as well as set short-term, medium-term, and long-term goals and targets, as part of a process of continuous improvement, we continue to implement an Energy Management System at our facilities which is in accordance with the requirements of the ISO 50001 International Standard. In 2016, the Sines Chemical Facility was certified, joining the ranks of eight facilities and one multisite business that are currently certified.

CC3.2
Do you classify any of your existing goods and/or services as low carbon products or do they enable a third party to avoid GHG emissions?

Yes

CC3.2a
Please provide details of your products and/or services that you classify as low carbon products or that enable a third party to avoid GHG emissions

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or avoided emissions?	Taxonomy, project or methodology used to classify product/s as low carbon or to calculate avoided emissions	% revenue from low carbon product/s in the reporting year	% R&D in low carbon product/s in the reporting year	Comment
Product	Autogas (automotive LPG): AutoGas is a true alternative to traditional fuels. Fast and economical to switch to, it is a clean, environmentally friendly option. These features have made AutoGas the most widely used alternative fuel in the world. Over 26 million drivers, more than 14 million in Europe, have already chosen it for their vehicle. Repsol AutoGas produces low CO2 exhaust emissions,	Low carbon product	Other: Methodology developed by Repsol	0.1%	Less than or equal to 10%	In 2016, we commercialized 44,000 tons of AutoGas, so approximately 25,000 tons of CO2 has been reduced with respect to conventional fuel emissions. The emissions saved have been estimated using a methodology developed by Repsol that take into account the consumption in litres per 100 km and the CO2 emissions per litre consumed for an average car. The decrease of CO2 emissions attained with Autogas is

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or avoided emissions?	Taxonomy, project or methodology used to classify product/s as low carbon or to calculate avoided emissions	% revenue from low carbon product/s in the reporting year	% R&D in low carbon product/s in the reporting year	Comment
	NOx emissions below 60 mg/km and low local pollutant emissions, being the reduction in NOx emissions against diesel came to 96%. The use of Autogas in direct injection liquid phase engines complies with the Euro 6c emissions standard (in force from 2017) in both emissions of gases (CO, HC and NOx) and the number of particles (reduction of 99%), with no need for a particle filter. The reduction in CO2 emissions against gasoline came to 15%, which will enable a new generation gasoline vehicle to attain the CO2 emission target set for 2020. The results of the project have been presented in a number of international congresses. We have also filed two applications for a European patent deriving from the same. The avoided emissions represent the third party's Scope 1 emissions. AutoGas vehicles are dual-fuel vehicles; they are fitted with two tanks, one for petrol and another for AutoGas, so you can travel twice as far between fill ups. There are already a lot of manufacturers in Spain marketing AutoGas vehicles; what's more, many petrol vehicles can be switched over to AutoGas. The technology consists of fitting a kit comprising a tank, gas lines, a vaporiser and injectors to a petrol engine. Repsol has 745 AutoGas supply points and we continue to add new sales points to our network of service stations to make this fuel more accessible. And it is thanks to our commitment to innovation that at Repsol we have achieved the biggest network of services stations supplying AutoGas in the whole Spain.					almost 15% with respect to gasoline. The emissions reductions calculated considers only CO2 (UNFCCC's website GWP =1)

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or avoided emissions?	Taxonomy, project or methodology used to classify product/s as low carbon or to calculate avoided emissions	% revenue from low carbon product/s in the reporting year	% R&D in low carbon product/s in the reporting year	Comment
Product	Warm recycled asphalt: The research strategy into asphalts is based on the development of eco-efficient processes and products, considering improvements not only during the manufacturing phase but also during their use. Consequently, we reduce CO2 emissions during road construction, road recycling and road maintenance, through a reduction in the consumption of fuels and raw materials (bitumen and aggregate), on reducing the working temperature and the amount of smoke generated, together with the use of high percentage of road recycled material. Repsol has developed various technologies to reduce the working temperature of asphalt mixes, from the initial manufacturing stage to its application to roads. A reduction of up to 50-60ºC can be achieved in the working temperature. Reducing the manufacturing and application temperature implies savings in energy and fuels in the plants during manufacture and storage, also the use of aged road material, allows a reduction in the raw materials needed up to 90%. The estimated energy savings are 20 to 40% in fuels. The avoided emissions represent the third party's Scope 1 emissions.	Low carbon product	Other: Methodology developed by Repsol	0.04%	Less than or equal to 10%	During 2016, the use of cold, warm and half-warm asphalt mixtures avoided approximately 166 tons of CO2 emissions, compared to those that would have been emitted if the asphalt had been produced using the traditional process. For its calculation, the reduction of 3kg of CO2 per ton of mix was considered. Repsol's Technology Centre has developed a specific methodology based on empirical information which establishes that the consumption of natural gas in the manufacturing stage is reduced 1.7 Nm3 per ton of asphalt produced by using these new technologies. The natural gas consumption has been measured with a gas meter and divided by the quantity of mixture produced. The Net calorific value used for estimating the energy saved and the emission factors are provided by IPCC Guidelines 2006. The emissions reductions calculated considers only CO2 (UNFCCC's website GWP = 1)
Product	Biofuels: Biofuels contribute to the reduction of CO2 emissions mainly in three ways: 1) avoiding the emissions associated with gasoline and diesel; 2) allowing the CO2 content of the fossil fuels to remain in storage and 3) providing a mechanism for CO2 absorption by growing new biomass for fuels. Repsol contribute to CO2	Low carbon product	Other: Methodology developed by Repsol	2.37%	Less than or equal to 10%	Due to the use of these biofuels marketed, we estimate that 930,000 ton of CO2 emissions were avoided, compared to the GHG emissions emitted by the use of an equivalent amount of gasoline and diesel in an energy basis. The emissions saved have been estimated using a methodology developed by Repsol. It is

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or avoided emissions?	Taxonomy, project or methodology used to classify product/s as low carbon or to calculate avoided emissions	% revenue from low carbon product/s in the reporting year	% R&D in low carbon product/s in the reporting year	Comment
	emissions reduction through the use of biofuels, incorporating bioethanol in gasoline and biodiesel and Vegetable Oil (VO) in gasoil. They are sold through Repsol service stations and direct sales to other suppliers. The avoided emissions represent the third party's Scope 1 emissions.					assumed, as indicated Fuel Quality Directive (FQD), that the average emissions saving capacity is 35% compared to the hypothetical use of conventional fossil fuels. The Net calorific value used for estimating the energy content of the biofuels marketed and the emission factors used to calculate the CO2 emissions from the combustion of the equivalent amount, in energy basis are provided by IPCC Guidelines 2006. The emissions reductions calculated considers only CO2 (UNFCCC's website global warming potentials (GWP)=1)

CC3.3

Did you have emissions reduction initiatives that were active within the reporting year (this can include those in the planning and/or implementation phases)

Yes

CC3.3a

Please identify the total number of projects at each stage of development, and for those in the implementation stages, the estimated CO2e savings

Stage of development	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	75	302474
To be implemented*	58	151453
Implementation commenced*	32	95962
Implemented*	257	314064
Not to be implemented	27	110076

CC3.3b

For those initiatives implemented in the reporting year, please provide details in the table below

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
Energy efficiency: Processes	During 2016, 32 energy efficiency measures related to efficiency improvements in furnaces, energy integration of units, more efficient energy generation and distribution and operation optimization of dynamic systems and processes were implemented in A Coruña Refinery (Spain). As an action to be highlighted in 2016, we improved the efficiency in furnaces recovering heat from the smokes (this measure enabled us to reduce CO2 emissions by 8,055t/year)	14191	Scope 1 Scope 2 (location-based)	Voluntary	1360000	6530000	4-10 years	11-15 years	
Energy efficiency: Processes	During 2016, 32 energy efficiency measures related to efficiency improvements in furnaces, energy integration of units, more efficient energy generation and distribution and operation optimization of dynamic systems and processes were implemented in Cartagena Refinery (Spain). As an action to be highlighted in 2016, we modified the air preheaters of the furnaces of the coker and vacuum units. This investment that will allow us to increase heat recovery, reducing the smoke output temperature and increasing the operating efficiency of the furnaces by up to 93%.	51614	Scope 1 Scope 2 (location-based)	Voluntary	5338000	8709000	1-3 years	11-15 years	
Energy efficiency: Processes	During 2016, 67 energy efficiency measures related to efficiency improvements in furnaces, more efficient energy generation and distribution and operation optimization of dynamic systems and processes were implemented in Puertollano Refinery (Spain). As an action to be highlighted in 2016, we replaced a steam turbine for a new one with an	66836	Scope 1 Scope 2 (location-based)	Voluntary	5885000	11499000	1-3 years	11-15 years	

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
	engine and variable speed in the catalytic reformer unit (this measure enabled us to reduce CO2 emissions by 8,300t / year).								
Energy efficiency: Processes	During 2016, 26 energy efficiency measures related to efficiency improvements in furnaces, energy integration of units, more efficient energy generation and distribution and operation optimization of dynamic systems and processes were implemented in Tarragona Refinery (Spain). As an action to be highlighted in 2016, we decomissioned the fuel heating system (this measure enabled us to reduce CO2 emissions by 5,228t / year).	44898	Scope 1 Scope 2 (location-based)	Voluntary	4998000	14909000	1-3 years	11-15 years	
Energy efficiency: Processes	During 2016, 37 energy efficiency measures related to efficiency improvements in furnaces, energy integration of units, more efficient energy generation and distribution and operation optimization of dynamic systems and processes were implemented in Petronor Refinery (Spain). As an action to be highlighted in 2016, we identified and minimized discharge points and optimized operation of liquid ring compressors in order to recover the largest possible amount of gas to be reused at the refinery instead of burning it on flare. These measures enabled us to reduce CO2 emissions by 15,000 tons/year at the refinery.	63367	Scope 1 Scope 2 (location-based)	Voluntary	6364000	417000	<1 year	11-15 years	
Energy efficiency: Processes	During 2016, 34 energy efficiency measures related to reduction of energy consumption by systems and processes optimization were implemented in Puertollano Chemical Facility	21205	Scope 1 Scope 2 (location-based)	Voluntary	2056000	2206000	1-3 years	11-15 years	

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
	(Spain). As an action to be highlighted in 2016, we have optimized the energy demand of the cracker. (This measure enabled us to reduce CO2 emissions by 13,333 tons/year)								
Energy efficiency: Processes	During 2016, 11 energy efficiency measures related to energy integration, efficiency improvements in furnaces and processes optimization were implemented in Tarragona Chemical Facility (Spain). As an action to be highlighted in 2016, modifications have been made in the gas turbine of the Cogeneration Plant to achieve the most efficient generation and distribution of energy (this measure enabled us to reduce CO2 emissions by 2,681t / year)	11986	Scope 1 Scope 2 (location-based)	Voluntary	1416000	697000	<1 year	11-15 years	
Energy efficiency: Processes	During 2016, 3 energy efficiency measures related to efficiency improvements in furnaces and more efficient energy generation and distribution were implemented in Sines Chemical Facility (Portugal). As an action to be highlighted in 2016, we have adapted the backpressure turbine's capacity to the steam needs of the Plant (this measure enabled us to reduce CO2 emissions by 5,855t / year)	6057	Scope 1 Scope 2 (location-based)	Voluntary	533000	4632000	4-10 years	11-15 years	
Energy efficiency: Processes	During 2016, 2 energy efficiency measures related to improvements in steam network and process optimizations were implemented in Santander Chemical Facility (Spain). As an action to be highlighted in 2016, modifications have been made in the postcombustion stage of the steam turbine . (These measures enabled us to reduce CO2 emissions by 9,254 tons/year)	9758	Scope 1 Scope 2 (location-based)	Voluntary	1072000	0	<1 year	11-15 years	

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
Energy efficiency: Processes	During 2016, 5 energy efficiency measures related to efficiency improvements in furnaces, energy integration of units, more efficient energy generation and distribution and operation optimization of processes were implemented in La Pampilla Refinery (Peru).	12982	Scope 1 Scope 2 (location-based)	Voluntary	1026000	0	<1 year	11-15 years	
Energy efficiency: Processes	During 2016, one energy efficiency measure related to operation optimization of dynamic systems was implemented in E&P Margarita (Bolivia).	5405	Scope 1 Scope 2 (location-based)	Voluntary	593000	453000	<1 year	11-15 years	
Energy efficiency: Processes	During 2016, 3 energy efficiency measures related to change of fuel were implemented in E&P kinteroni (Peru).	629	Scope 1 Scope 2 (location-based)	Voluntary	27000	24000	<1 year	11-15 years	
Energy efficiency: Processes	During 2016, one energy efficiency measure related to operation optimization of dynamic systems was implemented in E&P Block 16 (Ecuador).	2895	Scope 1 Scope 2 (location-based)	Voluntary	253000	0	<1 year	11-15 years	
Energy efficiency: Processes	During 2016, one energy efficiency measure related to logistic was implemented in E&P Casablanca (Spain).	516	Scope 1 Scope 2 (location-based)	Voluntary	44000	0	<1 year	11-15 years	
Energy efficiency: Processes	During 2016, one energy efficiency measure related to electricity consumption reduction was implemented in GLP.	1024	Scope 2 (location-based)	Voluntary	77000	7944000	>25 years	11-15 years	The investment not only includes energy efficiency savings. That's why the payback period is so high.
Energy efficiency: Processes	During 2016, one energy efficiency measure related to electricity consumption reduction was implemented in service stations.	701	Scope 2 (location-based)	Voluntary	49000	18000	<1 year	11-15 years	

CC3.3c

What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Compliance with regulatory requirements/standards	Repsol is working on the progressive implementation of Energy Management System (EnMS), via ISO 50001 standard. In 2016, the Sines Chemical Facility was certified, joining the ranks of eight facilities and one multisite business that are currently certified. Implementing these EnMS allows us to consolidate energy management criteria and best practices at different industrial facilities, apply them uniformly to the areas, systematize working methods, prioritize improvement opportunities and ensure that these efficiency criteria are present in all activities by integrating them with the others management systems. EnMS rely on studies and energy audits. We have developed a proprietary methodology to check the energy status of a process plant to quickly identify energy improvement opportunities in our Upstream facilities. Thus, the Operational Review - Energy (OR-E) let us to identify energy gaps and inefficiencies in order to find opportunities in our assets. We have applied this methodology in our Poseidon (Spain), TSP (Trinidad&Tobago), Bloque 16 (Ecuador) and PM3 (Malaysia) assets. To ensure a consistent approach across the entire company and to prevent and minimize the environmental impact of our operations on a global level, the E&P business has established a set of Environmental Performance Practices (EPP) applicable to all activities and projects, both new and existing assets. All Repsol's E&P activities must meet these minimum requirements to ensure that they are carried out in an environmentally-responsible manner and use the best internationally-accepted practices such as those established by the International Finance Corporation (IFC), the Joint Nature Conservation Committee (JNCC), the International Association of Geophysical Contractors (IAGC), the United States Environmental Protection Agency (USEPA) and ARPEL (the regional association of oil, gas and biofuel companies in Latin American and the Caribbean). The EPP covers all stages of an operation's life cycle: seismic studies, exploration, development, production and abandonment. It also specifies the main environmental factors to be taken into consideration: biodiversity, noise, atmospheric emissions, wastewater and waste management.
Compliance with regulatory requirements/standards	Each year an external company verifies that our greenhouse gas inventories comply with the highest quality and accuracy standards. In 2016, we reach 91% verification of all direct company emissions according to the international ISO 14064 standard. We must also highlight that the scope of verification includes the PM3 asset in Malaysia, one of the assets acquired from Talisman. Approximately 75% of GHG emissions in exploration and production are accounted for by this asset, where emissions are mainly caused by gas venting during extraction, with a high content of CO2 (making its reuse for energy purposes difficult) associated with the purification of the natural gas extracted from this asset. We are currently analyzing the implementation of alternative improvements to minimize this venting. Having implemented the ISO 14064 standard allows our facilities to systematically measure and continuously identify emission reduction opportunities.
Dedicated budget for low carbon product R&D	Repsol's Technology Centre sets annual budgets for product and process R&D, which include dedicated areas for low carbon activities. In 2016, approximately USD 2.3 Million have been invested in GHG reduction emissions R&D, in the following fields: - Biomass and biofuels R&D: USD 1.9 Million - Renewable energy (excluding biomass and biofuels): USD 0.1 Million - Electric vehicle R&D: USD 0.3 Million
Dedicated budget for energy efficiency	We have invested USD 390 Million in the 2011-2016 period in energy efficiency actions and we have the commitment to invest USD 550 Million by 2020. In addition, Repsol's Technology Centre sets annual budgets for product and process R&D,which include dedicated areas for energy efficiency. In 2016, approximately USD 10 Million have been invested in energy efficiency R&D.
Employee engagement	Employees variable remuneration linked to emissions reduction and energy efficiency targets on multiple levels of our organization.
Financial optimization calculations	An important driver for investing in emissions reduction activities remains the high proportion of energy cost in the total operating cost of our processes (60% on average in our refineries).
Internal price on carbon	At Repsol, we take the price of carbon into account for our strategic plans. This way, we prepare our company to a low emissions future defining a Corporate Carbon Pricing. The price of carbon is used to test base economics for investment decisions, ensuring that our portfolio is resilient to external CO2 regulations and policies, encouraging energy efficiency and low carbon technologies. CO2 price is also considered in risk management procedures of Business Units since new legislative developments could increase operational costs. That is to say, Carbon Pricing has influence and drives technology

Method	Comment
	choices and has had some influence around various design elements throughout the project life cycle. Our carbon price pathway starts with 15 USD$/t CO2 and this value will increase in the future. The aim is to reach 40 USD$/t CO2 by the middle of the coming decade.
Other	Catalogue of Emission Reduction Opportunities (CERO): In order to identify and promote the development of internal emissions reduction opportunities, we have implemented a sequential analysis process (CERO) that identifies energy efficiency and fuel switch initiatives, and evaluates them by means of feasibility studies. CERO identifies GHG emissions reduction opportunities throughout the organization and provides the information necessary in order to analyse, in cost-effective terms, the different alternatives for meeting regulatory requirements related to GHG emissions. It also permits an appropriate dissemination within Repsol of the energy efficient practices and technologies that are assessed or applied to any Business Unit.

Further Information
ISO 50001 certificates are attached

Attachments
ISO 50001 certificates.zip

Page: CC4. Communication

CC4.1
Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s)

Publication	Status	Page/Section reference	Attach the document	Comment
In voluntary communications	Complete	Sustainability Report 2016: Page 3: Message from CEO. Pages 10-11: Materiality. Pages 10-11: Stakeholder engagement. Pages 12-13: Governance. Pages 20-23: Climate Change	PDF Sustainability Report 2016.pdf	
In voluntary communications	Complete	Sustainability Report 2016 - Detailed Indicators: Pages 20-28: Energy efficiency and Climate change GRI Indicators: G4 EN3 / G4 EN5/ G4 EN6/ G4 EN18/ G4 EN17/ G4 EN4/ G4 EN30/ G4 EN7/ G4 OG6/ G4 OG2/ G4 OG3/ G4 EN7/ G4 OG14	2016 Sustainablity Report-Detailed indicators.pdf	
In voluntary communications	Complete	Annual Report 2016: Pages 1-2 Letter from the Chairman / Pages 3-4-Milestones / pages 4-6 Our commitment / pages 6-7 Emerging businesses.	PDF Annual Report 2016 Climate change.pdf	
In mainstream reports (including an integrated report) but have not used the CDSB Framework	Complete	Consolidated Management Report 2016: Page 5: Main figures and indicators - Environment. Pages 62-63: Improvement of operational efficiency – Reducing energy and carbon intensity in our value chain. Page 65: Operational efficiency indicators - Energy and Carbon Management. Pages 75-76: Energy sector outlook. Page 78-79: Risks- Risk factors- Strategic and operational risks- Climate change	PDF Consolidated Management Report 2016.pdf	
In mainstream reports (including an integrated report) but have not used the CDSB Framework	Complete	Consolidated Financial Statements 2016 - For the financial year 2016: Page 94-97: 31. Environmental information 31.3 Environmental Expenses /31.4 Carbon emission allowances. Page 127: Appendix IV - Regulatory Framework - Climate change and air quality	PDF Consolidated Financial Statements 2016.pdf	

Publication	Status	Page/Section reference	Attach the document	Comment
In voluntary communications	Complete	2016 Corporate Sustainability Plan and Year-End Report: Pages 39-40: Section: “Programme 5: The Environment” Climate Change actions	2016 Corporate Sustainability Plan and Year-End Report.pdf	
In voluntary communications	Complete	2016 Colombia Sustainability Plan Year-End Report Page 20: Section: “Programme 5: The Environment” Climate Change actions	2016 Colombia Sustainability Plan and Year-End Report.pdf	
In voluntary communications	Complete	2016 Ecuador Sustainability Plan and Year-End Report Page 39 : “Programme 5: The Environment” Climate change actions.	2016 Ecuador Sustainability Plan and Year-End Report.pdf	
In voluntary communications	Complete	2016 Spain and Portugal Sustainability Plan and Year-End Report: Pages 35-39: “Programme 5: The Environment” Climate change actions.	2016 Spain and Portugal Sustainability Plan and Year-End Report.pdf	
In voluntary communications	Complete	2016 Peru Sustainability Plan and Year-End Report Page 32: “Programme 5: The Environment” Climate change actions.	2016 Peru Sustainability Plan and Year-End Report.pdf	
In voluntary communications	Complete	2016 A Coruña Sustainability Plan and Year-End Report (in Spanish): Page 26: “Programme 5: The Environment” Climate change actions	Complex 2016 A Coruña Sustainability Plan and Year-End Report (Spanish).pdf	
In voluntary communications	Complete	2016 Cartagena Sustainability Plan and Year-End Report (in Spanish): Pages 17-18: “Programme 5: The Environment” Climate change actions.	Complex 2016 Cartagena Sustainability Plan and Year-End Report (Spanish).pdf	
In voluntary communications	Complete	2016 Petronor Sustainability Plan and Year-End Report: Pages 25-27: “Programme 5: The Environment” Climate change actions	Complex 2016 Petronor Sustainability Plan and Year-End Report (Spanish).pdf	
In voluntary communications	Complete	2016 Puertollano Sustainability Plan and Year-End Report: Page 22: “Programme 5: The Environment” Climate change actions	Complex 2016 Puertollano Sustainability Plan and Year-End Report (Spanish).pdf	
In voluntary communications	Complete	2016 Tarragona Sustainability Plan and Year-End Report: Pages 23-25: “Programme 5: The Environment” Climate change actions.	Complex 2016 Tarragona Sustainability Plan and Year-End Report (Spanish).pdf	

Publication	Status	Page/Section reference	Attach the document	Comment
In voluntary communications	Complete	ESG Roadshow 2016 : Our commitments with sustainability- Our position on Climate Change: Pages 21-26: Promoting a low carbon strategy	PDF ESG Roadshow 2016.pdf	
In voluntary communications	Complete	Website: All pages: Our position on climate change	Website Our position on climate change.pdf	
In voluntary communications	Complete	Website: All pages: Energy context	Website Energy context.pdf	
In voluntary communications	Complete	Website: All pages: Our energy and carbon map	Website Our energy and carbon map.pdf	
In voluntary communications	Complete	Website: All pages: Carbon strategy: striving	Website Carbon Strategy.pdf	
In voluntary communications	Complete	Website:All pages: Initiatives against climate change	Website Initiatives against climate change.pdf	
In voluntary communications	Complete	Website: All pages: The future of energy	Website The future of energy.pdf	
In voluntary communications	Complete	Website: All pages: Success stories	Website Success stories.pdf	

Further Information

Module: Risks and Opportunities

Page: CC5. Climate Change Risks

CC5.1

Have you identified any inherent climate change risks that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

Risks driven by changes in regulation
Risks driven by changes in physical climate parameters
Risks driven by changes in other climate-related developments

CC5.1a

Please describe your inherent risks that are driven by changes in regulation

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Cap and trade schemes	Scope:EU Structural reform of the European carbon market: To achieve at least 40% EU target, sectors	Increased operational cost	>6 years	Direct	Likely	High	The magnitude of the impact in our facilities under EU-ETS would be around USD 100 Million per year. This	We are implementing ambitious plans to reduce our CO2 emissions through energy efficiency. As	Repsol plans to invest around USD 550 Million in the period 2011-2020 through our plans of GHG

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	covered by the ETS have to reduce their emissions by 43% compared to 2005. The overall number of emission allowances will decline at an annual rate of 2.2% from 2021 to 2030, compared to 1.74% currently. The proposal tries to develop predictable, robust and fair rules to address the carbon leakage risk which may occur if production is transferred to less ambitious countries on climate policies. This includes: - Revising the system of free allocation focus on sectors at highest risk of relocating their production outside the EU. - More flexible rules to better align the amount of free allowances with production figures. - Update benchmarks to reflect technological advances since 2008. - Indirect carbon costs to be taken into account ensuring a level-						impact includes our refineries and chemical facilities in Europe and our activities in Norway and UK. The magnitude of the impact related to indirect carbon costs would be USD 25 Million per year if non financial compensation for indirect emissions cost is established for our refineries in Spain.	an example, during 2016 we reduced our emissions through specific energy saving actions of CO2e. The result was almost 290 kt emission reduction actions implemented in our EU refineries and chemical facilities. These measurements have an indefinite timeframe. We support that the effort in the fight against the climate change must be a commitment of the international community. EU must support the competitiveness of the industry, guarantee the safety of supply and assure the sustainability. Repsol has expressed its position directly to the European authorities. We are Fuels Europe and CEFIC members. Through these associations we advocate to keep free allocation to prevent carbon leakage in our downstream business. We are IOGP members	reduction emissions and energy efficiency in our refining and chemical facilities. USD 50 Million was invested in our EU refineries and chemical facilities in 2016.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	playing field. Lack of a harmonized EU-wide approach contributes to market distortions and does not allow a level-playing field between intra-EU competitors. Repsol supports the revision of the current draft to install an EU-wide harmonized system of financial compensation for indirect emissions costs and to stablish the list of eligible sectors based on total electro-intensity reflecting total consumption, as per the Environmental and Energy State Aid Guidelines. The Commission is evaluating different options for a system to avoid carbon leakage after 2020. Our European refineries and chemical facilities are included in the carbon leakage list and their competitiveness would be affected if they were excluded from the group of sectors deemed to be exposed to a significant risk of							as well. Through this association we advocate to include offshore platforms in the carbon leakage list.	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	'carbon leakage'. Our European facilities emit approximately 50% of company scope 1. On board generation of electricity on offshore platforms should be granted by free allowances. Allocation of free allowances for the emissions produced by the self-generation of electricity on board offshore platforms is justified by the absence of connection to the electricity grid and because it is for their own use (there are no retail electricity consumers to sell the electricity on to). Currently, phase III legislation doesn't give free allowance for electrical power generation on offshore platforms. If it doesn´t change in phase IV, compliance cost associated with phase IV of the EU ETS may have an impact on Repsol's business in UK.								

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Uncertainty surrounding new regulation	New Renewables Directive (REDII). Renewable Energy Directive establishes an overall policy for the production and promotion of energy from renewable sources in the EU in 2030. RED required the EU to fulfil at least 20% of its total energy needs with renewables by 2020 – to be achieved through the attainment of individual national targets. All EU countries must also ensure that at least 10% of their transport fuels come from renewable sources by 2020.On 30 November 2016, the Commission published a proposal for a revised Renewable Energy Directive to make the EU a global leader in renewable energy and ensure that the target of at least 27% renewables in the final energy consumption in the EU by 2030 is met.	Increased operational cost	>6 years	Direct	Likely	High	It is no possible to set financial implications due to the fact this new legislation is in a preliminary discussion. However, it is highly probable we will continue working with clients to achieve savings in the use of products. We will work with customers to motivate through incentives to implement energy efficiency in their facilities, equipment changes or reforms that may comply with existing regulations. This could have an impact in LPG, Direct Sales and petrol stations business because it would be required to review our sale contracts. The impact estimated is around USD 60 Million per year.	Repsol follows carefully all the regulatory changes that can affect our business. Our strategy is focus on increasing our company resilience against these regulatory frameworks. In the medium term we are continuously monitoring trends and the latest technologies being developed in alternative energies. We invest in sustainable mobility, research on biofuels, etc.	Repsol plans to invest around USD 550 Million in the period 2011-2020 through our plans of GHG reduction emissions and energy efficiency in our refining and chemical facilities. USD 50 Million was invested in our EU refineries and chemical facilities in 2016.
Carbon taxes	Prime Minister of Canada announced that the Federal	Increased operational cost	1 to 3 years	Direct	Likely	High	Currently under evaluation. From USD	We are implementing ambitious plans to reduce our CO2	New CO2 reduction plan is being developed in E&P business unit in

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Government will establish a “floor price” on carbon pollution of USD 7.5 per tonne in 2018, rising to USD 37.5 per tonne by 2022. Individual provinces will be able to decide how best to meet established national targets to reduce carbon emissions, whether that is achieved through a carbon tax or a cap-and-trade regime. The aim of this policy is to enable carbon instruments in all the provinces, in order to tackle Canada´s climate change commitments (expressed in the NDC). Canada Business Unit is evaluating how this federal commitment shape with current regulation in Alberta						10 to 110 in the 2021 – 2025 period.	emissions through energy efficiency. E&P Business Units is part of the plan and its contribution will be a key element in the future.	order to include Legacy Talisman in current Company emission reduction plan. Different departments are involved in this project throughout the Company. Corporate Units: Energy Efficiency and Carbon Department and Asset Management. Regional Business Units: Canada, USA, Ecuador, Bolivia and Malaysia.
Carbon taxes	Prime Minister of Canada has announced that the Federal Government will establish a “floor price” on carbon pollution of USD 7.5 per tonne in 2018, rising to USD	Increased operational cost	1 to 3 years	Direct	Likely	Medium	Canaport Scope 1 emissions are about 10,000 t CO2 equivalent per year. Considering the carbon price set by Canadian Government the impact would be	Canaport is analyzing different alternatives to reduce energy consumption. (Renewables, gas turbine, gas engine, etc.). In those alternatives different	To analyze the different alternatives we dedicate ¼ full-time worker (FTE) (estimated in USD 37,500, considering 100 USD/h)

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	37.5 per tonne by 2022. Individual provinces will be able to decide how best to meet established national targets to reduce carbon emissions, whether that is achieved through a carbon tax or a cap-and-trade regime. The aim of this policy is to enable carbon instruments in all the provinces, in order to tackle Canada´s climate change commitments (expressed in the NDC). New Brunswick is considering to implement a carbon pricing system (among other mechanisms), and could be similar to California and Quebec Cap and Trade system. This could affect our Canaport regasifier facility.						between USD 75,000 – USD 375,000 per year. Additionally, electricity price will probably increase as a result of this carbon market. Canaport Scope 2 emissions are about 8,500 t CO2 equivalent per year. Considering the CO2 prices and supposing that our electricity suppliers will translate the cost directly to us, the impact would be between USD 65,000. – USD 320,000	CO2 prices are considered in order to check the resilience of them.	
Fuel/energy taxes and regulations	Scope: European Union The Fuel Quality Directive 2009/30/EC states that the intensity of emissions of greenhouse gases (GHGs) associated with the life cycle of	Increased operational cost	3 to 6 years	Direct	Likely	High	Renewable Energy Directive (RED) will imply to incorporate 10% bios in our fuels marketed. On the other hand, Under Fuel Quality Directive (FQD) scope bios will	Repsol disagrees with the proposal of the Commission about Article 7A which establishes a European Base Line calculated as an average and, by applying a 6% of	Repsol has invested USD 0.5 Million in our E&P assets in 2016. The investment provided since the start of the IBIL project has amounted to USD 8 million.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	fuels placed on the market in 2020 should be 6% lower compared to the level EU average in 2010. The obligation of reducing these emissions would fall on the fuel suppliers. Repsol is affected by this regulation since our company is the most important fuel supplier in Spain. The 6% reduction target is likely to be achieved through the use of biofuels, electricity, the uses of less emission intense fuels and the implementation of GHG emissions reduction projects in the Upstream (Upstream Emission Reductions or UERs). Since 2014 the Commission is analyzing how UERs can be generated and verified in order to comply with this Directive. Scarcity of 2nd generation biofuels in the market in order to comply with Fuel Quality and Renewable Directives is a risk for						represent more than 13% in the final mix. This difference will represent an extra cost of at least 155 M$/year. This cost has been estimated considering the availability of advanced biofuels and the current market prices. For Oil & Gas companies non-market availability of second-generation bios and their cost is an important risk associated. The reduction is likely to be achieved through emission reductions projects in Upstream activities. However, due to the fact that the possibility of using Upstream reduction is not defined yet it is not possible to reduce the cost of this directive. The impact of not being able to transform the GHG emissions reduction potential estimated for our Upstream facilities in UERs due to inappropriate	reduction, fixes a common objective for every country. Each country has a different situation, the proposal will imply different efforts depending not only in the energy efficiency or in the environmental performance of its refineries, but on the market structure (diesel/gasoline) and on the refining schemes. Firstly, we have a specific E&P emission reduction target to improve the energy efficiency in our process. We have developed a methodology to check the energy status of a process to quickly identify energy improvement opportunities in our E&P facilities. In order to use these identified opportunities to fulfill Article 7A, we propose an approach with equivalent rules in all the Member States and using ISO 14064-1 as a standard to verify	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Repsol. Additionally, our Company is exposed to the risk of implementation of inappropriate rules to determine which emissions reduction projects will be eligible and to calculate and verify UERs.						eligibility and verification rules has been estimated in USD 20 Million up to 2020.	UERs. Secondly: We promote electrical mobility through IBIL, where we provide an integral recharging service based on 100% renewable energy. We boost the use of automotive LPG and advance lubricant formulas. We contribute to CO2 emissions reduction through the use of biofuels, incorporating bioethanol in gasoline and biodiesel and vegetable oil in gasoil. There is a department responsible for the optimization of the incorporation of bios to our fuel sales in order to comply with EED and FQD directives.	
Fuel/energy taxes and regulations	Scope: European Union Energy Efficiency Directive (2012/27/EU): This Directive requires Member States (MS) imposing indicative targets for energy efficiency to achieve savings of 20% of primary energy by 2020. Amongst other	Increased operational cost	1 to 3 years	Direct	Virtually certain	High	The main impact is Art 7, it implies working with clients to achieve savings in the use of products. We should work with customers to motivate through incentives to implement energy efficiency in their facilities, equipment changes or reforms	Repsol has expressed its position directly to the European and Spanish authorities: the transport fuel distributor cannot be an obligated party because it does not have a stable relationship with the final customers, so it cannot generate actions to reduce the	To the implementation of EnMS we dedicate one full-time worker (estimated in USD 150,000, considering 100 USD/h) and an annual certification cost about USD 90,000 to cover all of our certificated facilities).

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	issues, energy efficiency obligation schemes in order to ensure that either all energy distributors or all retail energy sales companies operating on the Member State's territory achieve annual energy savings equal to 1.5% of their energy sales to final costumers. The proposal also requires regular mandatory energy audits for large companies, the promotion of efficiency in heating and cooling and a regular review and monitoring of its implementation including an assessment of the energy efficiency levels of installations with a total rated thermal input of 50 MW or more. The Directive has been recently transposed by Member States. The key potential impact: transport fuel distributors, such as Repsol, are obligated parties in the energy						that may comply with existing regulations. This could have an impact in LPG, Direct Sales and petrol stations business because it would be required to review our sale contracts. The impact estimated is around USD 60 Million per year.	energy consumption of these final customers. Additionally we are involved in Sectorial Associations in order to include advocacy strategy elements on the development of this regulation. However, several actions are carried out to collaborate with our clients. For example for the LPG sales area, through our program “SolarGas” (which combines solar energy solutions with gas), customers will not only see their energy needs met with an emission-low supply, but can also access to energy efficiency advisory services to create a personalized design of the facility and select the best available technology. Estimated savings in gas consumption can reach 23%, thus reducing associated CO2 emissions. Repsol agrees with the Spanish transposition of the rest of EED. We are	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	efficiency obligation scheme and they need to achieve final energy savings each year from 1 January 2014 to 31 December 2020 of 1.5 % of the annual energy sales to their final customers.							developing EnMS in our industrial facilities as a way to improve our energy performance and to guarantee continuous improvement. We reduced 290,000 tCO2e in our refineries and chemical facilities in 2016.	
Fuel/energy taxes and regulations	Scope: European Union Renewable Energy Directive, RED (2009/28/EC): 20% of the total energy has to be produced by alternative (renewable) energies. In this way Member States are trying to boost them by giving monetary incentives to these technologies. Technologies as Combined Heat and Power (CHP), that currently are receiving those funds, will receive less monetary incentives in the future.	Increased operational cost	Up to 1 year	Direct	Very likely	Medium	Repsol generates through Combined Heat and Power installations (CHP) the power and steam their industrial processes need. The power that is not consumed in our industrial processes is sent to the national power grid. The main impact implies fewer revenues from the electricity that our CHP installations are sending to the grid. The government will reduce CHP monetary incentives. The overall impact estimated would be from 7 USD Million per year (5% reduction) to USD 21 Million per year (15% reduction).	Repsol has expressed its position directly to the Spanish authorities. Additionally we are involved in Sectorial Associations in order to include advocacy strategy elements on the development of this regulation. In 2016, Repsol has implemented GHG reduction emissions and energy efficiency initiatives in its CHP installations that suppose a reduction of 17,000 t CO2e/year.	During 2016, Repsol has invested USD 4.1 Million in GHG reduction emissions and energy efficiency in its CHP installations.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Fuel/energy taxes and regulations	Scope: European Union The directive "Promotion of clean and energy efficiency road transport vehicles" sets a specific emission target for transport. More precisely light vehicles have to reduce their emissions from 130 gr CO2/km in 2015 to 95 gr CO2/km by 2020.	Reduced demand for goods/services	1 to 3 years	Indirect (Client)	Very likely	High	The overall cost for our refining and marketing business units has been estimated in USD 100 Million in the period 2015-2020. This cost has been calculated considering the reduction of fuel marketed. Nevertheless, the impact for each company will depend on the competitiveness and resilience of its refining schemes and business model. In this way, Repsol has adapted its business to face this market situation.	Repsol has a resilient business model that allows us to face product demand changes. This way, Repsol has invested in its refining business in order to have advanced scheme in terms of complexity and flexibility will let Repsol to compete in a tighter market scenario. Repsol also identifies opportunities, boosts projects and implements initiatives in renewable energy for transport, biofuels, the use of automotive LPG or the development of more environmentally friendly products In 2016, we continued to promote electric mobility through IBIL, which provides an integral recharging service based on 100% renewable energy, smart terminals and installations, and an infrastructure control center. There are 859 operational recharging points. Our Electric	Repsol invested from 2007 to 2011 more than USD 4 billion in its Spanish refineries to improve their competitiveness. The investment provided since the start of the IBIL project has amounted to USD 8 Million. In 2016, we invested approximately USD 0.5 Million to promote the electric mobility through IBIL. Repsol's Technology Centre sets annual budgets for product and process R&D, which include dedicated areas for low emission activities. During 2016, USD 0.3 Million have been invested in Electric vehicle R&D, USD 0.1 Million in renewable energy and USD 1.8 Million in biofuels R&D. The cost of the external verification of the GHG emissions reductions achieved by Clima Project amounted in 2016 was around USD 4,200.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								Car Project, operated by IBIL, was selected for the third consecutive year as a CLIMA project. This project reduced CO2 by 330 tons in 2016 which were verified for the Ministry by an accredited entity in May of 2017. Other initiatives to promote GHG emissions reductions in transport sector were the use of automotive LPG in direct injection liquid phase engines, with a reduction in CO2 emissions against gasoline of 15%. Prospection studies of energy for transport enable us to anticipate technological changes and to define R&D projects to analyze the competitiveness of new propulsion systems in conjunction with different energy sources, identifying the most efficient solutions	
General environmental regulations,	Flaring of gas contributes to climate change and impacts the environment through	Increased operational cost	3 to 6 years	Direct	Likely	Medium	The current solution gas flaring limit for the province of Alberta has been set at	Repsol supports flaring reduction initiatives in its production sites as part of the energy	Repsol plans to invest around USD 550 Million in the period 2011-2020 through our

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
including planning	emission of CO2, black carbon and other pollutants. It also wastes a valuable energy resource that could be used to advance the sustainable development of producing countries. Flaring is a safety measure of the oil and gas processes, so, all of the initiatives towards flare gas reduction are focused on reducing the so called routine flaring. E&P assets are normally located in places without the necessary infrastructure to take advantage of flaring recuperation. Due to that, E&P is our more affected business by this new commitment. Several directives have been established to regulate flaring that can be a potential risk for Repsol. In Alberta, directive 060 includes a specific solution gas (associated to oil production) flaring limit of 670 x 106 m3 per year. Different						670x106 m3/year. According to Alberta Energy Regulator (AER) Directive 060, "if solution gas flaring exceeds the 670x106 m3 limit in any year, the AER will impose reductions that will stipulate maximum solution gas flaring limits for individual operating sites based on analysis of the most current annual data so as to reduce flaring to less than 670x106 m3/year". The latest set of annual data for year ending December 31, 2014 was published in ST60B: Upstream Petroleum Industry Flaring and Venting Report by the AER in February of this year. The report shows that the 2014 solution gas flared volume was below the limit of 670x106 m3/year and as such, we have not yet seen reductions stipulating maximum solution gas flaring limits imposed by the regulator. We	efficiency and CO2 emissions reduction plans. Flaring reduction initiatives have also a potential economical profit linked to the gas sales or the possible use of the gas as internal fuel. Our Environmental Performance Practices (EPPs) establish that new E&P installations shall not be designed to continuously vent or flare gases under normal operating conditions. For existing ones, an Action Plan shall be established to minimize continuous and non-continuous production venting and flaring of associated gas. Important efforts are being done in monitoring and characterization of the flared gas to create awareness on the wasted energy and promote efficient operation. Repsol, as signatory of the OGCI Joint collaborative declaration, has made a public commitment to	plans of GHG reduction emissions and energy efficiency in our refining and chemical facilities. There is also a part devoted to improve the energy efficiency In our E&P assets. Approximately 8% of these emissions reduction achieved already comes from recovery and use of gas that otherwise would have been flared. In order to boost the struggle against climate change, in 2016 we invested USD 100,000 in Low Emission Technology studies through the Oil & Gas Climate Initiative (OGCI).

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	limits apply in different situations. Malaysia The National Company Petronas has established within its carbon commitments, zero continuous venting and flaring to be incorporated in the design of new facilities by 2013. Our assets in Malasia could be affected by new legislation aim to zero routine flaring.						comply with the requirements stipulated in AER Directive 060.	eliminate routine flaring from its operations. On June 10th 2016, Repsol endorsed the World Bank Initiative Zero Routine Flaring by 2030. 5% of total Repsol CO2 emissions are due to flaring. For several years, we have implemented actions to minimize these emissions by recovering this gas and using it as fuel to generate heat or produce electricity. We have reduced 372 kt CO2 e/year through implementing more than 40 flaring reduction actions in the last 10 years	
General environmental regulations, including planning	Methane is 25 times more potent than CO2 and many consider the gas industry to be one of the largest man-made emitters of methane after agriculture. Increasing attention to methane emissions in the oil and gas sector risks undermining the case for increasing the role	Increased operational cost	3 to 6 years	Direct	Likely	High	At the provincial level, the government has announced a methane emissions reduction target of 45% (below 2012 levels) by 2025 from the O&G sector. The provincial government will introduce and apply new emissions designed standards to new facilities; improve	Internal studies to identify and quantify methane emissions from different sources have been conducted. Repsol is developing a plan to manage methane emissions which takes into account the procedures and actions already developed and try to implement new	In 2016 we invested USD 100,000 in Low Carbon Technology studies through the Oil & Gas Climate Initiative (OGCI). In addition, in 2016 a fund was created by OGCI (OGCI Climate Investment) to invest US$1 billion over 10 years to develop and accelerate the

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	of gas as a lower-carbon transition fuel. The International Energy Agency identified minimizing methane emissions from upstream oil and gas production as one of five key global greenhouse gas mitigation opportunities, noting that low-cost reductions in this area could account for nearly 15% (over 0.5 Gt CO2-eq) of the total greenhouse gas reductions needed by 2020 to keep the world on a 2-degree path. Several directives have been established to regulate methane emissions that can be a potential impact for Repsol. European Union: On July 20th 2016, a proposal for a Regulation of the European Parliament and of the Council on binding annual greenhouse gas (GHG) emission reductions by Member States from 2021 to 2030 was						measurement and reporting of methane emissions, as well as leak detection and repair requirements; and develop a joint initiative on methane reduction and verification for existing facilities. At the federal level, the government has announced a methane emissions reduction target of 40-45% below 2012 levels by 2025 from the O&G sector. The federal government will publish the proposed methane regulations by early 2017, with final regulations published by the end of 2017. These regulations will apply to new and existing sources, with the first requirements coming into force in 2018, and the remaining requirements coming into force by 2020. This regulation is going to be delayed in USA for two years	initiatives (e.g. Leak Detection and Repair – LDAR- programs) in order to achieve further methane emissions reductions in all of our operations. On the other hand, Repsol as signatory company of the OGCI Joint collaborative declaration has made a public commitment to collaborate with the other signatory companies in different areas, including natural gas developments, reducing methane emissions from our operations. On 10th June 2016 Repsol has signed the Memorandum of the Understanding (MoU) of the Climate and Clean Air Coalition Oil & Gas Methane Partnership initiative (CCAC-OGMP), to implement methane emission reduction projects in collaboration with other companies, institutions and governments. We seek	commercial deployment of low-emission technologies.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	published. These GHG include methane (CH4) emissions, among others. Additionally, the European Commission will consider new legislation to tackle methane emissions after MEPs endorsed scrapping its proposed reduction targets on 23rd November 2016. On the basis of this monitoring, measures to tackle methane levels will be considered, including a legislative proposal that could be based on ongoing studies which are due to come out in 2017. The deal reached with member states, scrapped a 33% cut to methane levels for 2030 proposed by the Commission. North America: The leaders of Canada, the U.S. and Mexico have committed on June 29th 2016 to an ambitious and enduring North American Climate, Clean Energy, and Environment							to eliminate barriers and come up with technical and economically viable solutions. This endorsement is fully aligned with Repsol policies and commitment as part of the OGCI.	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Partnership that sets them firmly on the path to a more sustainable future. The three leaders have agreed to cut methane emissions from the oil and gas sector by 40 to 45 per cent below 2012 levels by 2025, and to explore additional opportunities for methane reductions. Furthermore, they have shown their intention to invite other countries to join this ambitious target or develop their own methane reduction goal.								
Uncertainty surrounding new regulation	The Paris agreement is a historic landmark. The Paris agreement represents a change in the framework for managing carbon and climate issues, but it is not clear how the ambitious targets set can be realized. This can create risks for our company with regard to an unbalanced market for business to operate in. No reduction goals have been set for the different countries (NDCs submitted by	Increased operational cost	3 to 6 years	Direct	Likely	Low	Despite the fact that no reduction goals have been set for the different countries by now, Repsol is committed with the target of limiting the temperature increase below 2ºC. We are already working to mitigate climate change and we take, where applies, the price of carbon into account , so the additional financial implications would be low.	We are committed to the goal of mitigating climate change. We are already working through our CO2 emissions reduction and Energy Efficiency plans. We are working on a plan covering the period 2014-2020, which will represent a reduction of 1.9 million tons of CO2. From 2014 to 2016 we drove actions which reduced CO2eq by 1.2 millions of tons. This allows us to create a	Repsol plans to invest around USD 550 Million in the period 2011-2020 through our plans of GHG reduction emissions and energy efficiency in our refining and chemical facilities. There is also a part devoted to improve the energy efficiency in our E&P assets. Limiting the temperature increase not only 2ºC but also 1,5ºC will only be possible through

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	the countries set voluntary commitments), not even globally defined for the different periods (e.g., to 2030, to 2050). No sanction is included for the countries that do not accomplish with their commitment. No global carbon market has been defined. To be effective carbon pricing should be embedded in a coherent policy framework which safeguards a sector’s international competitiveness.							more sustainable and competitive company. As signatories of the Paris Pledge for Action document, we support the agreement and work to ensure that Repsol is part of the climate change problem's solution. Further evidence is provided by our espousal of the OCGI initiative. At Repsol we will continue to coordinate our actions and intensify our investments so as to contribute towards the reduction of greenhouse gas emissions. We focus on increasing energy efficiency in our operations, raising the portion of gas in the world's energy mix and deepening in the development of CO2 capture use and storage. We are defining a Corporate Carbon Pricing. The price of carbon is used to test base economics for investment decisions, ensuring that	innovation and technology, that are heavily dependent on the industrial sector and private companies effort and inversions. Repsol's Technology Centre sets annual budgets for product and process R&D, which include dedicated areas for low carbon activities. During 2016, approximately USD 12.5 Million have been invested in GHG reduction emissions R&D, in the following fields: - Biofuels R&D: USD 1.8 Million - Biomass R&D: USD 0.1 Million - Renewable energy (excluding Biofuels and biomass): USD 0.1 Million - Electric vehicle R&D: USD 0.3 Million - Energy efficiency R&D: USD 10.2 Million

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								our portfolio is resilient to external CO2 regulations and policies, encouraging energy efficiency and low emission technologies. CO2 price is also considered in risk management procedures of Business Units since new legislative developments could increase operational costs. Finally we research and develop low carbon technologies as electric mobility; biofuels and lubricants	

CC5.1b

Please describe your inherent risks that are driven by changes in physical climate parameters

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in precipitation extremes and droughts	Scope: Global Water scarcity potentially caused by increased incidence of drought poses a risk to some refining, chemical facilities and exploration and production operations which require water availability. Repsol operates in areas susceptible to water	Reduction/disruption in production capacity	>6 years	Direct	More likely than not	Medium	Repsol has estimated that the reduction in availability of water from surface resources and aquifers in water stress areas could impact our facilities, in the worst scenery, below USD 120 Million/annual taking into account a	Repsol has been minimizing the use of water in each facility for decades. Since 2012 Repsol tackled a new approach considering water as a strategic resource and strengthening local management with a global and homogeneous view	Globally, the costs associated to the water management in Repsol were USD 20 Million in 2016. In the last years, we have invested in some projects to reduce the impact in the water stress areas. As an example, in

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	scarcity. We aim to obtain sustainable water management by continuously searching for solutions to guarantee a responsible use of water resources and to preserve their quality, through the design and effective implementation of operations at all our facilities. During 2016, we withdrew 52,000 metric tons in the whole company, 9% less than the previous year. Most water is withdrawn in refining and chemical activities (92%) used in processes such as cooling, and producing steam. In terms of E&P, production water is often injected back into deposits during operations to extract oil and gas. The scarcity of water might require the stoppage of our production facilities hampering normal operation or interrupting supply chain. Besides, incidence into oil wells would have important consequences associated with lost production. Currently, some of Repsol's facilities are						reduction of 1% in the production capacity. This number is an estimate over the gross margin of our assets.	on the application of standards and best practices. Repsol developed the Repsol Water Tool (RWT) which incorporates aspects of the IPIECA Global Water Tool and the GEMI Local Water Tool. RWT allows us to have a detailed vision of water management and the risks associated to each asset. From this, we have defined an improvement action plan for 2015-2020. The specific water management actions for each facility focus on 3 areas: - Improving our knowledge of the surroundings and use of water to keep a good inventory - Preparation for new regulatory requirements. - Reduction of competition for water Compliance with actions included in the long-term plans has been introduced as a company target.	Tarragona it has been invested around USD 7.4 Million and that include a regeneration plant of urban waste water. In Cartagena the investment in the same period has been around USD 4.3 Million in order to reduce water consumption and increase recycling of treated water prior to discharge. In 2016, we invested USD 160 Million in projects to improve water management.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	located in water stress areas, mainly in the East of Spain (for example Cartagena Refinery and Tarragona Industrial facility) and Bolivia (for example Margarita production facility). This calculation has been made using the Global Water Tool for the Oil&Gas sector, as well as other studies available at a local level with more precise information. We have considered an area under water scarcity when the projected renewable water availability by 2025 is below 1,700 m3/person/year. The AR5 explains that there is a tendency for drying of the mid-continental areas during summer, indicating a greater risk of droughts in those regions. Changes in precipitation extremes and droughts caused by climate change could increase the number of our installations located in water stress areas or aggravate the magnitude of this impact in those that are currently affected by this risk.							In 2016, Repsol goal was to reach 85% compliance with the work lines related to the 3 areas described above. This goal has been surpassed thanks to the efforts of businesses, reaching an implementation of 95%. According to the results, new lines of work will be included progressively in the future. Repsol also worked on adapting the RWT in order to identify and assess the main risks related to water in unconventional activities and in assets acquired in the purchase of Talisman. Repsol objective for 2017 is to implement the Action Plan defined for these new assets.	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in precipitation extremes and droughts	Scope: Global Water scarcity potentially caused by increased incidence of drought poses a risk to biofuels manufactures. A great deal of water is required to produce fuel from biologic feedstock. With an ever increasing population, limited supplies of clean and fresh water, and increasing energy demands, the sustainability of biofuels is in question if requirements for water cannot be decreased. The vast majority of the water used to produce biofuels is consumed during agricultural steps. Due to this, certain biofuel feedstock cannot be used to sustainably produce biofuels. Some feedstock, like cellulosic feedstock (generally just left over after food crops are harvested) uses much less water, but nowadays cannot be obtained on a large-enough scale to meet current fuel demands. The AR5 explains that there is a tendency for drying of the	Increased operational cost	>6 years	Direct	More likely than not	Medium	Water scarcity may suppose an increase in the biofuels manufacture cost. Despite of this, we will have to be able to continue incorporating biofuels in our gasolines and diesels in order to comply with Fuel Quality and Renewable Directives. Considering increment costs of 20%, the estimated financial implications would be about USD 30 Million.	Repsol follows two lines of action in the area of biofuel manufacturing: - The promotion of advanced biofuel projects (from non-food raw materials, biomass) with strong technological development and heightened sustainability. Although we have currently not started production on this type of biofuel, at Repsol's Technology Centre we have projects in the development phase both for biotechnology processes (advanced fermentation) as well as thermochemical processes (pyrolysis and processing in refinery units) - The production of Hydrotreated Vegetable Oil (HVO) and hydrobiodiesel in our refineries. This is a vegetable oil obtained from oleaginous seeds treated with hydrogen	Repsol's Technology Centre sets annual budgets for product and process R&D, which include dedicated areas for biofuels. During 2016, approximately USD 1.8 Million have been invested in biofuels.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	mid-continental areas during summer, indicating a greater risk of droughts in those regions. Changes in precipitation extremes and droughts caused by climate change could increase the number of our areas located in water stress areas or aggravate the magnitude of this impact in those that are currently affected by this risk. As a result, using biofuels to reduce greenhouse gas emissions may be only possible developing advanced biofuels that don't require such a high quantity of water. This can be a potential risk for Repsol because it will increase biofuels manufacture cost							that is used to make gasoil. These two lines of action help to reduce CO2 emissions without increasing water withdrawal. To guarantee sustainability of our biofuels, we follow international schemes that certify the traceability of the raw materials included throughout the production chain. Specifically, our facilities are operating under the International Sustainability & Carbon Certification (ISCC) and RED Bioenergy Sustainability Assurance (RBSA) schemes. As an example, in 2016, we continued our Bottom-Up Synthetic Biology project, which involves research in advanced biofuel production from renewable raw materials, such as lignocellulosic biomass, which	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								would result in reducing carbon footprint in comparison with fossil fuels.	
Tropical cyclones (hurricanes and typhoons)	Scope: Global Increase storms and hurricane activity. The most susceptible assets identified are offshore Oil&Gas rigs in the Gulf of Mexico. Tropical cyclones such as hurricanes or typhoons cause damages to installations and may require the stoppage of our production facilities or hamper normal operation. This may be associated with reduction/disruption of our production activities and the interruption of our supply chain. The increased frequency and magnitude of hurricane activity is a risk to our installations in these areas and demands preventative measures.	Reduction/disruption in production capacity	>6 years	Direct	More likely than not	Medium	The incidence of tropical cyclones is likely to cause damages to installations in vulnerable areas, with corresponding financial implications of repairing and potential disruption of production. The main area with risk of hurricanes where Repsol has facilities is USA. The net asset value of these facilities is around USD 3000 Million. However, Repsol´s facilities are insured against such incidents and as such the financial implications are significantly mitigated.	Emergency plans have been developed and implemented so as to prepare staff for reacting in the event of a storm. The plans are principally designed to protect the safety of the staff but also involve certain measures to limit damages to the installation. Another important method used by Repsol for managing this risk is insurance for severe weather events. This practice has become more prevalent with the increased frequency of tropical storms in the Gulf over the past decade. The described methods reduce the magnitude to a certain extent. The methods have an indefinite timeframe. The company continues to advance in the development of	No significant additional costs other than regular investment costs and those related to training practices are associated with the emergency plans developed in these facilities. The higher frequency and severity of extreme weather events would undoubtedly lead to increased insurance premiums for extreme weather event coverage. The extent of future increases in premiums is still unknown.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								adaptation measures to climate change. We are conducting a detailed review of the physical risks that could potentially affect to each business unit in order to improve and complete the risk management that is being done. Repsol is evaluating how to implement the necessary measures to improve the adaptive capacity of our facilities in order to cope with climate-related extreme weather events.	
Sea level rise	Scope Global Floods: Repsol's operations located at/or near sea-level could be impacted with floods resulting in physical damages. The risk of flooding due to the rise of sea level is present in several of Repsol's facilities such as Petronor Refinery in Spain or all the fuel storage and supply systems located in seaports where we operate. The incidence of flooding would cause damages to our	Reduction/disruption in production capacity	>6 years	Direct	More likely than not	Medium	The incidence of flooding would cause damages to installations, with corresponding financial implications of repairing and potential disruption of production. Repsol´s facilities are insured against such incidents and as such the financial implications are significantly mitigated.	Emergency plans. The measures taken to mitigate the impacts are specific to each installation as they depend on the layout of the operations and the source of the risk. The measures implemented include emergency plans which establish several measures to protect the staff and mitigate the impact in its facilities. Repsol	No significant costs other than regular investment costs and those related to training practices are associated with the emergency plans developed in these facilities. The higher frequency and severity of extreme weather events would undoubtedly lead to increased insurance premiums for extreme weather

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	installations and may require the stoppage of our production facilities or hamper normal operation. This may be associated with reduction/disruption of our production activities and the interruption of our supply chain.							also purchases comprehensive insurance which covers floods for all operations. The damages caused by floods in previous years are believed to have been curtailed by preventative actions and the costs associated with incidents of flooding have been covered by Repsol's insurance. The described methods reduce the magnitude to a certain extent. The methods have an indefinite timeframe The company continues to advance in the development of adaptation measures to climate change. We are conducting a detailed review of the physical risks that could potentially affect to each business unit in order to improve and complete the risk management that is being done. Repsol is evaluating how to implement the	event coverage. The extent of future increases in premiums is still unknown.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								necessary measures to improve the adaptive capacity of our facilities in order to cope with climate-related extreme weather events.	
Change in temperature extremes	Scope: Global Risk of thaw. In 2011, Repsol and Alliance Oil Company signed a joint venture for exploration and production of hydrocarbons and we are working together in Siberia. The activity peak season is November to April, during winter, at temperatures of -45 °C, because it is the correct time for drilling wells, construction and operation of the facilities. It‘s during these months when the transport and distribution systems can be operated properly. The area again melts in spring and becomes a big swamp accessible only by helicopter and caterpillar vehicles, disrupting the transportation of the staff and materials and the distribution of oil and gas produced. A similar situation occurs in Alaska at North Slope where also	Reduction/disruption in production capacity	>6 years	Direct	More likely than not	Medium-high	The production activity of this kind of areas requires very high investment; thawing permafrost affects the buildings, pipelines, airfields, and coastal facilities. The damage to infrastructures and facilities would have a high cost of maintenance and additionally a shorter Oil&Gas exploration season has a negative impact on the economic results, having to support the same fixed costs for a shorter time in which we are able to work.	Projects in Siberia and Alaska are an important technical challenge that allows us to prepare our people and innovate in technology. Repsol is working in this kind of projects since 2006 and it is implementing the right measurement to minimize the risks. Thanks to these described methods the magnitude of the risks is expected to be reduced to a certain extent. The methods have an indefinite timeframe The company continues to advance in the development of adaptation measures to climate change. We are conducting a detailed review of the physical risks that could potentially affect to each	The management cost related with this risk is currently zero.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Repsol is working. The AR5 explains that is very likely that heat waves will be more intense, more frequent and longer lasting in a future warmer climate, which could cause the thawing of permafrost that means a risk of shorter winters that would alter the access to fossil fuel reserves and increase our operational costs.							business unit in order to improve and complete the risk management that is being done. Repsol is evaluating how to implement the necessary measures to improve the adaptive capacity of our facilities in order to cope with climate-related extreme weather events.	
Change in mean (average) temperature	The AR5 explains that average warming for the period 2016-2030 is likely to be +0.3ºC and +0.7ºC, compared with the period 1986-2005; and potentially as high as +4.8ºC by the end of the century. Changes in temperature as a result of climate change pose different risks to Repsol. One of them is the loss of performance in our Combined Heat and Power installations (CHP) If the ambient temperature increases, it causes a loss in yield due to the decrease in the mass flow rate into the gas turbines as air density decreases. Hot weather conditions can also be a	Reduction/disruption in production capacity	>6 years	Direct	Likely	Medium	Repsol generates through Combined Heat and Power installations (CHP) the power and steam their industrial processes need. The power that is not consumed in our industrial processes is sent to the national power grid. A loss in yield will reduce our capacity to generate steam and electricity. Currently, CHP electric equivalent yield is around 70%. Considering a yield reduction of 5%, the estimated financial implications would be about USD 9	The company continues to advance in the development of adaptation measures to climate change. We are conducting a detailed review of the physical risks that could potentially affect to each business unit in order to improve and complete the risk management that is being done. Repsol is evaluating how to implement the necessary measures to improve the adaptive capacity of our facilities in order to cope with climate-related extreme weather events.	Internal resources are used to evaluate different alternatives to minimize this risk. During 2016, Repsol has invested USD 4.1 Million in GHG reduction emissions and energy efficiency in its CHP installations.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	risk for the functioning of the cooling towers. Cooling is less efficient when the temperature of water increases.						Million per year. A reduction of the cooling water efficiency may result in a slowing down of the refineries and chemical facilities production. A decrease of 1% in the products sold would have an estimated financial implication of about USD 90 Million per year. This number is an estimate over the gross margin of our downstream facilities.	Different alternatives are being implemented (for example Exhaust Gas Heat exchangers in our Heat Recovery Steam Generators). In 2016, Repsol has implemented GHG reduction emissions and energy efficiency initiatives in its CHP installations that suppose a reduction of 16,700 t CO2e/year.	

CC5.1c

Please describe your inherent risks that are driven by changes in other climate-related developments

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Changing consumer behavior	Scope: Global We recognize that climate change would represent a risk of shifting demand for Repsol's products. An increasing demand for climate-friendly products and technologies would probably result in a decreasing demand for GHG-intensive products. This could be considered a commercial risk that	Reduced demand for goods/services	>6 years	Direct	Likely	High	This economic impact would result in a reduced stock price and/or a diminished demand for the products we produce as automotive and industrial fuels. Repsol can observe that a reduction of 1% in stock price or a decrease of 1% in the demand of our	Repsol undertakes rigorous market analysis as part of the strategic planning exercises. These analyses take into account evolving demand for its products as a result of many factors including price-pressure and changing market sentiment due to climate change and environmental factors.	Repsol has invested during 2016 around USD 60 million in alternatives energies, and USD 0.5 Million to promote the electric mobility through IBIL. Repsol's Technology Centre sets annual budgets for product and process R&D, which include dedicated areas for

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	would erode the competitiveness of companies which are not able to adapt to this shift in consumption patterns. Hence, climate change could become a commercial risk if Repsol is not able to adapt their product portfolio to the requirements of a low-emissions society. New consumption patterns could potentially result in a decrease in demand for more carbon-intensive products produced by Repsol such as automotive and industrial fuels. Future low-emission products and technologies could influence consumer choices for automotive and industrial fuels that would require Repsol to adapt to the changing dynamics. This risk could affect Repsol products produced in all countries in which we operate.						products and services would be approximately USD 90 Million per year. This estimation has been done including downstream facilities, considering the figures of the reporting year.	Financial implications are then factored into the strategic planning. Repsol is investing in technology related with new energies. We develop market products and services that enable GHG emissions to be reduced or avoided, in areas as combined heat and power (CHP), electric transportation, biofuels, warm asphalts and autogas. In order to reduce the carbon footprint of our processes and products, the Repsol Technology Centre works to identify improvement opportunities in the units, both on an operating level and identifying specific investments with an important potential for reducing CO2 emissions. Repsol has implemented methodologies that aid energy management in our facilities, systematically detecting potential energy savings in process plants. These	low carbon activities. During 2016, approximately USD 12.5 Million have been invested in GHG reduction emissions R&D, in the following fields: - Biofuels R&D: USD 1.8 Million -Biomass R&D: USD 0.1 Million - Renewable energy (excluding Biofuels and biomass): USD 0.1 Million - Electric vehicle R&D: USD 0.3 Million - Energy efficiency R&D: USD 10.2 Million In 2016, the investment required for implementing the emissions reduction activities in our facilities was around USD 60 million.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								tools allow us to obtain a ranking of potential savings and prioritize the allocation of resources for improvement actions. Repsol is also committed to the development of new energy sources and technologies, contributing to a more diversified energy future. We direct our efforts not only to reducing the energy intensity of our productive processes and facilities, but also to the design of products that reduce the GHG emissions when are used	
Other drivers	Scope: Global An increased competition from renewable energy and from the commercialization of hybrid and fully electric vehicles could reduce demand for GHG intensive products. This could be considered a commercial risk that would erode the competitiveness of companies which are not	Reduced demand for goods/services	>6 years	Direct	More likely than not	High	This economic impact would result in a reduced stock price and/or a diminished demand for the products we produce as automotive and industrial fuels. Repsol can observe that a reduction of 1% in stock price or a decrease of 1% in the demand of our products and services	Our company identifies opportunities, promotes projects and implements business initiatives in areas as renewable electric generation and electric transportation. Repsol manages all these opportunities through our Carbon strategy and the collaboration of the different business Unit, Sustainability Direction	For many years our company has made considerable efforts in: - Developing and marketing of improved fuels and biofuels for transport, helping our customers achieve more efficient, less emission-intensive mobility. - Developing new low-emission technologies and exploring new

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	able to adapt to this shift in consumption patterns. Hence, climate change could become a commercial risk if Repsol is not able to adapt their product portfolio to the requirements of low-emissions society. New consumption patterns could potentially result in a decrease in demand for more carbon-intensive products produced by Repsol such as automotive and industrial fuels. Future low-carbon products and technologies could influence consumer choices for automotive fuels that would require Repsol to adapt to the changing dynamics. This risk could affect Repsol products produced in all countries that we operate.						would be approximately USD 90 Million per year. This estimation has been done including downstream facilities, considering the figures of the reporting year.	and our R&D Department. Repsol is investing in technologies related with alternative energies. We promote electrical mobility through our participated company IBIL. We have 859 operational charging points, and we continue to consolidate the fast-charging infrastructure for electric vehicles in Repsol Group service stations. Repsol's Electric Car Project, operated by IBIL, has been selected for the third consecutive year as a CLIMA project. This project was able to reduce CO2 by 330 tons in 2016, which were verified for the Ministry by an accredited entity in May of 2017. Electrical mobility has been also incorporated to the Repsol paddock of MotoGP circuits. Other initiatives in the transport sector have been the use of autogas (automotive LPG) in direct injection liquid	business models such as electric mobility (though a participated company, IBIL), and alternative energies. Repsol has invested during 2016 around USD 60 million in alternative energies, and USD 0.5 Million to promote the electric mobility through IBIL. These actions are a key part of our mission to provide the greatest number of people with access to sustainable and secure energy. During 2016, approximately USD 0.1 Million have been invested in R&D renewable energy, USD 0.3 Million in R&D Electric vehicles and, USD 1.8 Million in R&D biofuels.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								phase engines and advance lubricant formulas for the engine and gearboxes and differentials. Prospection studies of energy for transport enable us to anticipate technological changes and promote R&D projects to analyze the competitiveness of new propulsion systems in conjunction with different energy sources.	
Uncertainty in market signals	Scope: Global Governments around the world have signed-up to a climate change goal of limiting the temperature increase since pre-industrial times to no more than 2°C, the limit that the IPCC (International Panel for Climate Change) establishes as the maximum to avoid climate change. Central values from scientific modelling suggest that around 3650 GtCO2eq is the estimated cumulative amount of CO2 that the atmosphere can allow up to the limit of 2°C ("the carbon budget"). Given that	Reduced stock price (market valuation)	>6 years	Direct	About as likely as not	High	The economic impact for Repsol associated to this risk could be high. The issue of Stranded Assets covered an analysis addressing the profitability of projects and evaluation of company risk in the long term through exposure to complex projects, such as the Arctic or oil sands, requiring high oil prices to be profitable. We select the most profitable projects and evaluating them in accordance with	Stranded assets matter is complex, and has many uncertainties that deserve reflection and analysis. Repsol is working in different forums and is engaging with investors to gain insight into this topic. Repsol's valuation is based on commercial reserves. Our reserves timeframe is 11 years, a shorter period than any scenario analyzed by Carbon Tracker. Repsol has no exposure to any complex project requiring a high investment and high oil prices to be profitable.	Repsol plans to invest around USD 550 Million in the period 2011-2020 through our plans of GHG reduction emissions and energy efficiency in our refining and chemical facilities. Additionally our company invested around USD 60 million in alternative energies, and USD 0.5 Million to promote the electric mobility through IBIL. Repsol's Technology Centre sets annual budgets for product and process R&D, which include

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	roughly 2040 GtCO2eq have already been emitted to date, this suggests that future emissions should be limited to 1600 GtCO2eq. Caution must be used as different analyses manage to calculate different budgets from the same data. Nevertheless, the “unburnable carbon” notion asserts that it is estimated that there are more than 3670 GtCO2eq contained in the oil, natural gas and coal resources. The “stranded assets” debate has undergone a significant pivot, and is now much more focused on capital discipline, with more focus on a specific-individual company scale, with reports that attempt to quantify the economic impact to shareholders from company performance. Investors could perceive a higher risk in investment in Oil&Gas companies and could provoke a loss of company value if there is an inadequate management and report of						sensitivity scenarios. The regulatory changes emerging out of Paris Agreement are among the additional factors to be analyzed and taken into account in our decisions. The concept of Stranded Assets failed in its definition of the term "reserves". What the Carbon Tracker published in the year 2011 refers to reserves not reflected in our market value, as they are contingent resources, and not reserves, the development of which depends on a contingency, and a long-term timeframe. In its books Repsol only publishes proven reserves (those we can produce) in accordance with the criterion of the SEC	We will not be drilling in the Arctic, and have no oil sands projects. We are aware of the challenge that climate change means to our industry. We have been working for many years on energy efficiency (a reduction of 4.3 MtCO2 has been achieved for the period 2006-2016), including the reduction of flaring and venting. We are also working for the future, developing new technologies and exploring new business models such as electric mobility (through IBIL). Energy consumption increases worldwide as a consequence of economic growth and society demands more energy. It is also our responsibility to provide it. Not all the fuels are the same in terms of unburnable carbon concepts. Gas is the lowest carbon-intensive fossil fuel Repsol is well positioned with respect to its competitors. Our	dedicated areas for low carbon activities. During 2016, approximately USD 12.5 Million have been invested in GHG reduction emissions R&D, in the following fields: - Biofuels R&D: USD 1.8 Million - Biomass R&D: USD 0.1 Million - Renewable energy (excluding Biofuels and biomass): USD 0.1 Million - Electric vehicle R&D: USD 0.3 Million - Energy efficiency R&D: USD 10.2 Million

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	this issue. This risk could affect all Repsol activities.							Upstream portfolio is evolving towards a higher percentage of gas compared to oil: around 65% of our production and 75% of our reserves are gas. The stranded asset notion is included in the risk management processes of our company.	
Other drivers	Scope: Global The fossil fuel divestment movement is a network of campaigns and campaigners working towards fossil fuel divestment in the communities. The majority of campaigns are asking institutions to: 1) Immediately freeze any new investment in fossil fuel companies; 2) Divest from direct ownership and any commingled funds that include fossil fuel public equities and corporate bonds within 5 years. This initiative has been created in the context of climate change international negotiations and the commitment of limiting the temperature increase since pre-industrial times to no more than 2°C, established by	Reduced stock price (market valuation)	>6 years	Direct	About as likely as not	High	The economic impact for Repsol associated to this risk could be high.	Repsol is working in different forums and is engaging with investors to gain insight into this topic. We are aware of the challenge that climate change means to our industry. We have been working for many years on energy efficiency (a reduction of 4.3 MtCO2 has been achieved for the period 2006-2016), reducing flaring and venting, introducing biofuels. We are also working for the future, developing new technologies and exploring new business models such as electric mobility (through a participated company, IBIL). Meanwhile, energy consumption increases worldwide as	Repsol plans to invest around USD 550 Million in the period 2011-2020 through our plans of GHG reduction emissions and energy efficiency in our refining and chemical facilities. Additionally our company invested around USD 60 million in alternative energies, and USD 0.5 Million to promote the electric mobility through IBIL. Repsol's Technology Centre sets annual budgets for product and process R&D, which include dedicated areas for low carbon activities. During 2016, approximately USD 12.5 Million have

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	the IPCC (International Panel for Climate Change) as the maximum to avoid climate change. The fossil fuel divestment movement could influence investor choices and could lead to the belief that there is a higher risk in investment in Oil&Gas companies. This could incite a loss of company value if there is an inadequate management and report of this issue. This risk could affect all Repsol activities.							a consequence of economic growth and society demands more energy. It is also our responsibility to provide it. It is important to highlight that not all the fuels are the same in terms of CO2 emissions. Gas is the lowest carbon-intensive fossil fuel. In this sense, at Repsol we are well positioned with respect to our competitors. Our Upstream portfolio is evolving towards a higher percentage of gas compared to oil: around 65% of our production and 75% of our reserves are gas.	been invested in GHG reduction emissions R&D, in the following fields: - Biofuels R&D: USD 1.8 Million - Biomass R&D: USD 0.1 Million - Renewable energy (excluding Biofuels and biomass): USD 0.1 Million - Electric vehicle R&D: USD 0.3 Million - Energy efficiency R&D: USD 10.2 Million

Further Information

Page: CC6. Climate Change Opportunities

CC6.1

Have you identified any inherent climate change opportunities that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

Opportunities driven by changes in regulation
Opportunities driven by changes in physical climate parameters
Opportunities driven by changes in other climate-related developments

CC6.1a

Please describe your inherent opportunities that are driven by changes in regulation

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Fuel/energy taxes and regulations	Scope: European Union Energy Efficiency Directive (2012/27/EU): This Directive requires Member States (MS) imposing indicative targets for energy efficiency to achieve savings of 20% of primary energy by 2020. It can be an opportunity for Repsol because we are investing in several actions to improve EE and reduce GHG emissions in our processes. Specifically Repsol conducts energy audits and keeps training their staff in the different Business Units to find savings and possibilities for reducing their energy consumption. Related to that, Repsol has planned to establish Energy Management System (EnMS) in their facilities under the international standard ISO 50001.	Reduced operational costs	1 to 3 years	Direct	Virtually certain	Medium-high	Repsol is implementing Energy Management Systems (EnMS) in their facilities according to the requirements of International Standard ISO 50001. This standard helps us to formalize the company's vision and energy policy, as well as set short-term, medium-term, and long-term goals and targets, as part of a process of continuous improvement. The EnMS contributes to find new energy efficiency actions, reducing greenhouse-gas (GHG) emissions. Therefore, monetary savings related with non-used energy are obtained. The annual monetary savings reached in 2016 thanks to the implementation of the energy efficiency actions have been USD 23 Million. The figure has been calculated taking into account only the facilities that are currently certified under ISO50001	We implemented a sequential analysis process to identify and promote the development of GHG reduction opportunities. Our catalogue of GHG emission reduction opportunities is continuously updated and around 1,250 actions have already been identified in our facilities worldwide. All our Business Units carry out detailed energy efficiency programs that develop specific activities to improve its energy performance. These programs also include action plans containing the objectives and defined improvement actions. In 2016, more than 250 savings actions were carried out in our facilities. We are implementing	Repsol plans to invest around USD 550 Million in the period 2011-2020 through our plans of GHG reduction emissions and Energy efficiency in our refining and chemical facilities. To the implementation of EnMS we dedicate one full-time worker (estimated in USD 150,000, considering 100 USD/h) and an annual certification cost about USD 90,000 to cover all of our certificated facilities).

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							standard in the European Union	also EnMS in our business. In 2016, the Sines Chemical Facility was certified following the ISO50001 standard, joining the ranks of eight facilities and one multisite business that are currently certified.	
Fuel/energy taxes and regulations	Scope: European Union. Current and future regulatory requirements related to climate change generate business opportunities for Repsol. These new requirements increase the demand of low-emission products and services, open up new markets and boost access to market shares. For example, within the EU Commission's Climate and Energy Package 2020, the approved Renewable Energy Directive (2009/28/CE) and Fuels Quality Directive	New products/business services	1 to 3 years	Direct	Very likely	Medium	We have been investing since 2010 in transport electrification, advanced biofuels, energy storage and renewable electricity generation.Emerging Business Division identifies new opportunities, investing in technology-based start-ups and new energy sources. We continue working on the INNVIERTE program which is part of the 2013-2020 Spanish Strategy of Science, Technology and Innovation. This strategy contains objectives, reforms and measures that must be adopted with the aim of driving growth and	We monitor trends and latest technologies developed in renewable energy. We invest in sustainable mobility and contribute to emissions reductions via production of and research on biofuels. We continue investing in electric mobility through IBIL. We have 859 operational charging points, and we are consolidating the fast-charging infrastructure in our service	Repsol has invested during 2016 around USD 60 million in alternative energies, and USD 0,5 Million to promote the electric mobility through IBIL. Repsol's Technology Centre sets annual budgets for product and process R&D, which include dedicated areas for low carbon activities. During 2016, approximately USD 12.5 Million have been invested in GHG reduction emissions R&D, in the following fields: - Biofuels R&D: USD 1.8 Million -

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	(2009/30/CE) provide an important stimulus to the demand for renewable energies and biofuels. This represents an essential legal framework and a decisive step towards promoting the development of renewable energy sources. Repsol is working on alternative electricity generation and new mobility schemes. Through IBIL, we invest in electric mobility, providing a comprehensive recharging service using 100% renewable energy, smart facilities and terminals, and a control center for the infrastructure. We had also invested in technology-based start-up that boosts our activities.						impact.The program consists of an agreement with the CDTI for co-investment in Spanish technology SMEs from the alternative energy and efficient energy sphere. The joint commitment is USD 9.3 Million, where Repsol invests USD 5.3 Million and manages the portfolio of companies produced Our investment in promoting electric mobility through IBIL has been USD 8 Million so far verified CO2 emissions reduction stands at 850 tCO2 amount equivalent of CO2 absorption in a year of more than 15000 trees	stations. Ministry of Agriculture, Food and the Environment. Chose our Electric Car Project, operated by IBIL, as a CLIMA project over the maximum period possible We contribute to CO2 emissions reduction through the use of biofuels, incorporating bioethanol in gasoline and biodiesel and VO in gasoil. Regarding biofuel manufacturing, we focus on two action lines: - Promotion of advanced biofuel projects (from non-food raw materials, biomass) with strong technological development and heightened sustainability. Although we still haven’t started production on this	Biomass R&D: USD 0.1 Million - Renewable energy (excluding Biofuel and biomass): USD 0.1 Million - Electric vehicle R&D: USD 0.3 Million - Energy efficiency R&D: USD 10.2 Million. In 2016 a fund was created by OGCI (OGCI Climate Investment) to invest US$1 billion over 10 years to develop and accelerate the commercial deployment of low-emission technologies.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								type of biofuel, our Technology Centre have projects in the development phase both for biotechnology processes as well as thermochemical processes - Hydrotreated Vegetable Oil or hydrobiodiesel production in our refineries, which consists of a vegetable oil obtained from oleaginous seeds treated with hydrogen, makes up part of the gasoil composition. As part of OGCI one of the working groups is related to energy efficiency in transport and in exploring low emissions technologies in transport.	
International agreements	Scope: Global The Paris agreement is a historic landmark. It addresses the fact that there is a global,	Reduced operational costs	1 to 3 years	Direct	Likely	Medium	Repsol has drawn one of the longest standing Carbon Strategies of the sector gaining a competitive advantage	We have been committed to mitigating climate change We are working through	We plan to invest around USD 550 Million in the period 2011-2020 through the GHG reduction

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	scientific problem that we must all resolve together. The Paris agreement represents a change in the framework for managing carbon and climate issues, which devises a great opportunity for our company for 2 reasons: Repsol supports this agreement and has been working on emission reduction initiatives since a long time ago. The company has drawn one of the longest standing Carbon Strategies of the sector gaining a competitive advantage on this issue. Repsol has extensive experience at identifying new opportunities for energy saving. These involve GHG reduction and therefore less emission allowances. A reduction of 314,000 tCO2 was achieved in 2016. This way, Repsol						on this issue. We are implementing ambitious plans to reduce our CO2 emissions through energy efficiency. As an example, during 2016 we reduced our emissions in 314,000 tons of CO2 through specific energy saving actions of CO2e. The estimated annual monetary savings of these actions have been around USD 31 Million.	our CO2 emissions reduction and Energy Efficiency plans. The former Energy Carbon Plan (2006- 2013) achieved a reduction of 3.1 million t CO2. The current plan covers 2014-2020and will represent an additional reduction of 1.9 million tCO2. From 2014 to 2016, we have reduced 1.2 million of tCO2e. We focus on increasing energy efficiency in our operations, raising the gas portion in the world's energy mix and deepening in the development of CO2 capture use and storage (CCUS). The natural gas CO2 emissions per energy unit are approximately half of those related to	emissions and energy efficiency plans in refining and chemical facilities. There is also a part devoted to improve the energy efficiency in E&P assets. Limiting the temperature increase not only 2ºC but 1.5ºC will only be possible through innovation and technology that are heavily dependent on the industrial and private sector effort and investments. Our Technology Centre sets annual budgets for product and process R&D, including areas for low carbon activities. In 2016 around USD 12.5 Million were invested in GHG reduction emissions R&D, in these fields: - Biofuels:USD 1.8Million - Biomass:USD 0.1Million - Renewable energy (excluding Biofuels

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	supports carbon pricing. A global carbon market will reduce uncertainty and states clear rules in order to preserve our competitiveness in a global level-playing field agreement.							coal, not including performance gap between technologies in electricity generation. Regarding our competitors we are well positioned. Our Upstream portfolio keeps a higher percentage of gas 65% of our production and 75% of our reserves are gas. CCUS will be critical to get the Paris Agreement goals due to its ability to reducing GHG emissions Fossil fuels will play a significant role in future energy mix and CCUS will reduce emissions in electric power generation or energy-intensive industries. This is an a OGCI work line. Further evidence of our commitment provided by our OCGI initiative	and biomass): USD 0.1Million -Electric vehicle: USD 0.3Million -Energy efficiency:USD 10.2Million In 2016 OGCI created a fund (OGCI Climate Investment) to invest USD1 billion over 10 years to develop and accelerate the deployment of low-emission technologies.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								espousal. We are monitoring trends and the latest technologies developed in renewable energy. We invest in sustainable mobility and contribute to emissions reductions through the production of and research on biofuels.	
Carbon taxes	The Intergovernmental Panel on Climate Change (IPCC) says that we need to reach zero net emissions by 2100 to stabilize Climate Change around the 2°C target above pre-industrial temperatures, agreed by governments as the maximum acceptable amount of global warming. Carbon Pricing is an essential piece of the path toward this decarbonization. In most cases, carbon pricing policies take the form of an	Reduced operational costs	3 to 6 years	Direct	Likely	Medium	The majority of our Canadian assets are in the province of Alberta, and the rest are in the province of Saskatchewan. Over 95% of our GHG emissions in Canada are from our assets in Alberta. Only one facility, the Edson Gas Plant, is subject to SGER. For this asset, the Baseline Emissions Intensity is 0.1382 tons CO2e/m3OE, where OE stands for Oil Equivalent. The 2016 reduction target was 15%, which amounted to a Net Emissions Intensity Limit of 0.1175 tons	One of the main reasons why we have been able to achieve the reduction target is due to the presence of our cogeneration units and the treatment of cogeneration under the SGER, which "recognizes the environmental benefits associated with the higher energy efficiencies generally afforded by cogeneration operations". As such, we anticipate that we will continue to achieve the	The installed power of this cogeneration plant is 10 MW. Considering an installation cost of USD 1 Million per MW, the cost for our company has been USD 10 Million.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	emissions trading system (ETS), but some jurisdictions have also implemented carbon taxes, as it is the case of Alberta. Alberta's Specified Gas Emitters Regulation (SGER) first came into effect in 2007. It requires facilities that emit 100,000 metric tons or more of greenhouse gases a year to reduce their emissions intensity. As of January 1, 2016 the target emissions intensity is 15% below the established facility baseline level and as of January 1, 2017 the target emissions intensity will be 20% below the established facility baseline level. At the same time, the applicable price of carbon for facilities to pay (if they do not meet the intensity targets) is USD$20/ton (as of January 1, 2016) and USD$30/ton (as of						CO2e/m3OE. Our 2016 Emissions Intensity was 0.089 tons CO2e/m3OE, well below our Limit. No financial penalties from this regulation are considered currently in our risk management.	reduction targets of 15% and 20% in 2016 and 2017, respectively.	

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	January 1, 2017). In 2018, the SGER will be replaced by a Performance Standard and carbon allowances and facilities will have to meet that Standard to avoid paying the USD$30/ton levy for each ton that is over the allowance limit.								
General environmental regulations, including planning	Scope: Global Several directives have been developed to regulate flaring. Flaring of gas contributes to climate change and impacts the environment through emission of CO2, black carbon and other pollutants. Flaring is a safety measure of the oil and gas processes; so, all of the initiatives towards flare gas reduction are focused on reducing the so called routine flaring. E&P is our business affected by this new commitment due to the fact that their	Reduced operational costs	3 to 6 years	Direct	Likely	Medium	Flaring reduction initiatives have an economical profit potential associated to the gas sales or to the possible use of the gas as internal fuel.	Repsol, as signatory company of the OGCI Joint collaborative declaration, has made a public commitment to collaborate with eliminating routine flaring from its operations. On June 10th 2016, Repsol has endorsed the Zero Routine Flaring by 2030 World Bank Initiative, which allows us to collaborate with other companies and institutions to look for the most advanced technologies that minimize the routine gas flaring	Repsol plans to invest around USD 550 Million in the period 2011-2020 through our plans of GHG reduction emissions and energy efficiency in our refining and chemical facilities. There is also a part devoted to improve the energy efficiency In our E&P assets. Approximately 8% of this emissions reduction achieved already comes from recovery and use of gas that otherwise would have been flared. In order to boost the struggle against climate change, in 2016 we

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	installations normally have routine flaring (these assets are normally located in places without the necessary infrastructure to take advantage of flaring recuperation). This can be an opportunity for Repsol because flaring wastes a valuable energy resource that could be used to advance the sustainable development of producing countries.							by 2030. This endorsement is fully aligned with Repsol policies and as part of the OGCI. Repsol Environmental Performance Practices (EPPs) establish that upstream new installations shall not be designed to continuously vent or flare gases under normal operating conditions. For existing facilities, an Action Plan shall be established to minimize continuous and non-continuous production venting and flaring of associated gas. Specific energy analysis towards the identification of flaring reduction potential has been included in the upstream operational review-energy methodology.	invested USD 100,000 in Low Carbon Technology studies through the Oil & Gas Climate Initiative (OGCI).

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								Important efforts are being done in monitoring and characterization of the flared gas to create awareness about the wasted energy and promote efficient operation. 5% of total Repsol CO2 emissions are due to flaring. For several years, we have implemented actions to minimize these emissions by recovering this gas and using it as fuel to generate heat or produce electricity. We have reduced 372 kt CO2 e/year through implementing more than 40 flaring reduction actions in the last 10 years	
General environmental regulations, including planning	Scope: Global Several directives have been established to regulate methane emissions. Methane is 25 times more	Increased production capacity	3 to 6 years	Direct	Likely	Medium	Methane reduction initiatives have an economical profit potential associated to increase gas production capacity.	Repsol as signatory company of the OGCI Joint collaborative declaration has made a public commitment to	In 2016 we invested USD 100,000 in Low Carbon Technology studies through the Oil & Gas Climate Initiative (OGCI). In

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	potent than CO2 and many consider the gas industry to be one of the largest man-made emitters of methane after agriculture. The International Energy Agency identified minimizing methane emissions from upstream oil and gas production as one of five key global greenhouse gas mitigation opportunities, noting that low-cost reductions in this area could account for nearly 15% (over 0.5 Gt CO2-eq) of the total greenhouse gas reductions needed by 2020 to keep the world on a 2-degree path. Reducing methane emissions can be an opportunity for Repsol to increase gas production capacity.							collaborate with the other signatory companies in different areas, including natural gas developments, reducing methane emissions from our operations. On the 10th of June of 2016 Repsol has signed the Memorandum of the Understanding of the Climate and Clean Air Coalition Oil & Gas Methane Partnership initiative (CCAC-OGMP), to implement methane emission reduction projects in collaboration with other companies, institutions and governments. We seek to eliminate barriers and come up with technical and economically viable solutions. This endorsement is fully aligned with Repsol policies and	addition, in 2016 a fund was created by OGCI (OGCI Climate Investment) to invest US$1 billion over 10 years to develop and accelerate the commercial deployment of low-emission technologies

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								commitment as part of the OGCI. Internal studies to identify and quantify methane emissions from different sources have been conducted. Repsol is developing a plan to manage methane emissions which takes into account the procedures and actions already developed and try to implement new initiatives (e.g. LDAR programs) in order to achieve further methane emissions reductions in all of our operations. It is important to highlight that natural gas can play a key and immediate role in reducing fossil fuel emissions, but only if we succeed in mitigating the methane emissions associated with our production. Around 75% of	

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								our portfolio is natural gas, so minimizing the sources of methane is a priority for our company.	
Emission reporting obligations	The Directive 2014/95/EU on disclosure of non-financial and diversity information by certain large undertakings and groups requires companies concerned to disclose in their management report, information on policies, risks and outcomes as regards environmental matters, social and employee aspects, respect for human rights, anticorruption and bribery issues, and diversity in their board of directors. This will provide investors and other stakeholders with a more comprehensive picture of a company's performance. This can be an	Other: Transparency	1 to 3 years	Direct	Likely	Low	When it comes to reporting and transparency, it is always difficult to estimate the financial implications. Moreover, the company has been reporting our climate change commitment and our developments on these areas for a long time. In addition, other reports and communications are fulfilled as our Sustainability Reports among others. That is why is difficult to estimate financial impacts in the company. The financial implications will be low because we have already been reporting all this information.	We support the EU legislation on mandatory carbon reporting. The directive requirements involved significant efforts to adjust our current reporting processes, but at the same time represented a great opportunity to increase transparency and confidence of society, investors and regulators in our company. Repsol reports already all the information required by the directive. The 2016 Repsol Sustainability Report has been produced in accordance with the Global	The design, translation, layout and verification cost of our 2016 Sustainability Report has been USD 120,000. Additionally, to determine material issues to report in this report, we have carried out expectation identification studies to our stakeholders. Such studies are based on the recommendations of the AA1000 standard. The cost of these studies has been USD 50,000.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	opportunity to share our stakeholders our commitment with climate change. The company has been committed for a long time to the goal of mitigating climate change, and working through our CO2 emissions reduction and Energy Efficiency plans in order to reach this objective.							Reporting Initiative Sustainability Reporting Guidelines, version GRI G4, including the sector supplement for oil and gas companies, in the exhaustive version. The Report also meets the criteria of AA1000 AS 2008 standard of inclusiveness, materiality and responsiveness, and it has been verified under the AA1000 AS 2008 standard. In drawing up this Report, we have taken into account the document on transparency, communication and standards in sustainability reports and notes drawn up by the Spanish State Council for Corporate Social Responsibility (CERSE). In	

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								addition, integrated reporting marks an important milestone in the market-led evolution of corporate reporting. In this regard, in 2016 Repsol has expanded and has integrated environmental information in its Consolidated Management Report as can be seen in the published report for 2016	
Emission reporting obligations	Policymakers have an interest in ensuring that the financial system is resilient to all forms of risk. In April 2015 the G20 asked the FSB to consider risks related to climate change and in November the FSB proposed the creation of an industry-led Task Force to develop recommendations on climate-related	Other: Transparency	3 to 6 years	Direct	Likely	Low	Currently, we disclosure our climate-related risks and opportunities through our Sustainability Reports and our public response to CDP.	We recognize and support the need for transparency on a wide range of environmental and social issues that impact the oil and gas sector, including issues related to climate change. Currently, we disclose our climate-related risks and opportunities through our Sustainability	The design, translation, layout and verification cost of our 2016 Sustainability Report has been USD 120,000. Additionally, to determine material issues to report in this report, we have carried out expectation identification studies to our stakeholders. Such studies are based on

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	financial disclosures. Appropriate disclosures are a prerequisite for financial firms not only to manage and price climate risks accordingly but also, if they wish, to take lending, investment or insurance underwriting decisions based on their view of transition scenarios. In December 2015 the FSB launched the industry-led Task Force on Climate-related Financial Disclosures (TCFD). The Task Force will develop a set of recommendations for consistent, comparable, reliable, clear and efficient climate-related disclosures by companies, as requested in the FSB's proposal. The TCFD has concluded that its recommendations will apply broadly to financial and non-financial firms. The							Reports and our public response to CDP. Additionally, Repsol is member of IPIECA (International Petroleum Industry Conservation Association). IPIECA is designing a framework for oil and gas companies to publicly disclose information in a simple, straightforward and transparent manner. It is still in pilot phase, but it is generally aligned with the FSB scope. IPIECA has sent a letter to TCFD with its comments, and has offered its experience in developing IPIECA's Framework.	the recommendations of the AA1000 standard. The cost of these studies has been USD 50,000. The estimated cost of including this information in our Management Report is about USD$100,000.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	wide range of existing disclosure schemes relating to climate highlights the importance of companies and relevant stakeholders reaching a consensus on the characteristics of effective disclosures and examples of good practices. The industry-led Task Force will take account of the work of other groups related to effective disclosures. However, the TCFD's initial report highlights that whilst there are a significant number of existing climate disclosure regimes, only a limited number of them consider climate-related financial risks. The Task Force published its phase 1 report in April 2016. During the second phase, the Task Force's work was focused on delivering specific								

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	recommendations for voluntary disclosure principles and leading practices, if appropriate, with a view to issuing a report for public consultation by end-2016. As part of its work the Task Force is conduct public outreach to engage a wide and varied range of stakeholders as it develops its recommendations. This can be an opportunity to share our stakeholders our commitment with climate change. The company has been committed for a long time to the goal of mitigating climate change, and working through our CO2 emissions reduction and Energy Efficiency plans in order to reach this objective.								
Other regulatory drivers	On December, 2nd 2015 the European Commission presented a Circular Economy Package. It consists of an EU	New products/business services	3 to 6 years	Direct	Likely	Medium-high	Following the Circular Economy Package Repsol has the opportunity to develop sustainable products and expand it customer	In 2016 Repsol has approved a Circular Economy (EC) Strategy which is considering	Circular Economy management costs are supported by the Business Units. We also hire external services for

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Action Plan for the Circular Economy that establishes a concrete and ambitious program of action, with measures covering the whole cycle: from production and consumption to waste management and the market for secondary raw materials. Legislative measures will enter into force by the end 2017. The Circular Economy is a new economic management model based in closing the loop of the products and services life cycle, managing the resources (materials, water, energy), processes and residues in a sustainable way. Circular Economy package is an opportunity for Repsol to diversify business models and to create value. Repsol launched the Circular Economy Strategy in 2016.						portfolio including new customers that search products with less impact in the climate change. In addition, there is an opportunity to reduce costs implementing measures related to operational efficiency. Some of the Circular Economy initiatives will require financing. The European Commission and the European Investment Bank are offering financing support in a special program.	different issues related to the EC package. Develop new products made from alternative raw materials (waste, renewable materials…). In addition, develop life cycle analysis studies to quantify environmental impacts of the new products. There are 4 employees to promote and monitor Circular Economy initiatives, which are managed by the Business Units. Circular Economy initiatives have to be collaborative. It is very important to establish links with external companies. We are working with 40 external companies and 100 different external focal points. We also participate in 7 working groups	consulting matters, such as the elaboration of Life Cycle Analysis (LCA). The cost of each LCA is approximately USD 11,000. This will be implemented in the following years. The external service expenses in 2016 were USD$ 150,000.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								with institutions. There are currently more than 90 initiatives, managed by 40 different focal points. 25 of the initiatives come from the networking with external partners. Internal innovation is also being promoted. Circular Economy initiative can be proposed by all employees. These initiatives are evaluated by the different business units. All initiatives will be evaluated through a LCA or Eco design of the new products to quantify environmental impacts	

CC6.1b

Please describe your inherent opportunities that are driven by changes in physical climate parameters

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in precipitation	Scope: Global We aim to obtain sustainable water management by	Reduced operational costs	>6 years	Direct	More likely than not	Medium	The oil and gas industry is increasingly	Repsol has been minimizing the use of water in each of our	The water pilot studio that we carried out in 2016 in Puertollano

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
extremes and droughts	continuously searching for solutions to guarantee a responsible use of water resources and to preserve their quality, through the design and effective implementing operations at all our facilities. The application of the hierarchical controls of replacing water use, reducing water consumption, and the reuse and recycling of water needs are areas in which our company needs to continue working in order to promote opportunities in water management. Water efficiency within oil and gas operations can be optimized through the use of technology and other management practices that are appropriate to the local social, environmental and economic conditions. The promotion of integrated water resource management within the industry can lead to opportunities such as greater						becoming a water management industry. By 2020, the industry will generate over 500 million barrels of produced water a day. With effective management this water can be a source of value, as disposal options become limited and environmental regulations tighten. The global market for water management solutions and services in the onshore oil and gas industry is worth around USD 37.9 billion. The market for water-tech is growing globally. The business opportunities will be higher in water scarcity areas. Repsol handle annually 70 Million m3 of produced water, which suppose a cost of about USD 260 Million per year. In case we could find new business opportunities related	facilities for decades. The company has developed the Repsol Water Tool (RWT) which incorporates aspects of the IPIECA Global Water Tool and the GEMI Local Water Tool. RWT allows us to have a detailed vision of the risks associated to each center and the possibility to improve water management E.g. in 2016 we carried out a water pilot studio in Puertollano refinery in collaboration with a specialized external advisor. We conducted a detail revision of the different types of water uses, identifying operational improvements and investments to optimize its use and searching improvement opportunities through units' interdependence. The final objective was to identify best practices and extend conclusions to other facilities Another example of a new	refinery to promote water management opportunities had a cost of USD 0.2 Million. In the produced water treatment process for alternative uses (other than reinjection), the most important cost is the desalination, and depends on the total dissolved solids (TDS) to be removed. The average cost estimated is around 1 USD/m3. Repsol handle annually 70 Million m3 of produced water. In case we could find new business opportunities related to 1% of our produced water, the cost of management would be around USD 0.7 Million per year.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	efficiency of water use, costs reductions, compliance with new regulations, etc. For Repsol, the need to optimize the efficiency of water use in oil and gas operations is essential. In addition, Repsol is searching business opportunities related to water scarcity, examining market niches in which our company could work and be competitive. In this sense, studies have concluded that produced water of our E&P assets may be valorized, moving from being a cost to represent an opportunity.						to produced water and achieve a reduction of 1% in the management costs, we would save USD 2.6 Million per year.	business opportunity has been analyzed in our E&P facilities. Water is presented in our wells, and it is extracted with the oil and gas. Produced water is often used as an injection fluid. Produced water, being contaminated with hydrocarbons and solids, must be disposed of in some manner, and disposal to sea or river will require clean-up first. However, the processing required to render produced water fit for reinjection may be equally costly. The treatment and valorization of produced water will reduce injection costs and may imply the generation of new incomes where water has a market, apart from other strategic profits and company image improvement.	
Change in temperature extremes	The melting of Arctic ice as a result of climate change could make possible open passages	Reduced operational costs	>6 years	Direct	About as likely as not	Low	Financial implications of these routes have not been quantified yet due to	Repsol is not currently managing this opportunity since there is not absolute	As all of these measurements are included in our business as usual, the

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	for increasing periods of time. It could become an attractive major shipping route for the transportation of the products produced by Repsol in the next 10 to 20 years. This would be an opportunity for our Trading and Transport Department, which is in charge of the marketing, supply and transportation activities in the international markets. The new routes through the Arctic would reduce the distance travelled by the ships operated by Repsol, yielding considerable savings in fuel costs and CO2 emissions. As an example, Repsol regularly buys Ural crude from the Baltic Sea to be processed in our refineries. The main loading port is Primorsk from which the route to transport the crude oil to our refineries is through the Baltic Sea. This area regularly faces about 6 months of ice. From November to April (approximately) the sea						the uncertainty of them. But considering the number of annual loads of Ural Crude bought on the Baltic sea ports and the difference prices of the vessels when it's necessary to use ice class, Repsol has estimated the impact if these months were reduced by half would traduce in savings of around USD 3 Million each year.	certainty about available routes. Repsol does not anticipate the routes as a viable alternative even within the next decades. But Repsol through its Transport and Trading Direction department always works to find the best alternatives for the logistic of our crudes, although for the moment is not absolutely certainty about how the climate change could affect them. Our Trading and Transport Department is always working on the management of the trips to and from all our refineries to get the most efficiency solution for our Company. By implementing this action, the magnitude of the opportunity would increase since it allows Repsol to take advantage of the hypothetical new situations on the market. This action has	additional cost related is zero.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	is frozen and it is compulsory the use of a special freight (called Ice Class) in order to break the ice on its routes. These special vessels have an extra cost compared with the normal ones. If the winter months would be shortening by a half due to change in temperatures, thereby the cost associated with the logistics of these crude oils would be reduced.							an indefinite timeframe.	
Change in temperature extremes	Scope: Global The demand for electricity and fuels is closely linked to the climate and average temperatures. Higher temperatures in summer may result in an increase of the electricity demand by clients for cooling of air conditioners. On the other hand, lower temperatures in winter may result in an increase of the demand of fuels and electricity for heating. An increase of the electricity and fuel demand may suppose higher CO2 emissions.	Increased demand for existing products/services	>6 years	Direct	About as likely as not	Medium-high	The potential financial impact of this opportunity is an increase of the revenues thanks to an increase of the demand for electricity and gas natural. Increment electricity demand: Repsol generates through Combined Heat and Power installations (CHP) the power and steam their industrial processes need. The power that is not consumed in our industrial processes is	Natural gas (lowest carbon-intensive fossil fuel) represents a great portion of our business (65% of the production and 75% of our reserves). We are undertaking real and sustainable actions to manage emissions and enhance the role of natural gas in the near future. As signatory of the OGCI Joint collaborative declaration we have made a public commitment to collaborate with the other signatory	In 2016, the adhesion costs to the OGCI initiative has been USD 100,000. In addition, in 2016 a fund was created by OGCI (OGCI Climate Investment) to invest US$1 billion over 10 years to develop and accelerate the commercial deployment of low-emission technologies.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Governments around the world have signed-up to a climate change goal of limiting the temperature increase since pre-industrial times to no more than 2°C, the limit that the IPCC (International Panel for Climate Change) establishes as the maximum to avoid climate change. The challenge of providing more energy with less CO2 emissions can be an opportunity for Repsol. We recognize both the importance of the climate challenge and the importance of energy to human life and well-being. Not all the fuels are the same in terms of CO2 emissions. Natural gas is the lowest carbon-intensive fossil fuel and represents nowadays a great portion of our main reserves (around 65% of our production and 75% of our reserves are gas). Repsol is undertaking real and sustainable actions to manage emissions and enhance						sent to the national power grid. The main impact implies more revenues from the electricity that our CHP installations are sending to the grid. The positive impact would be from USD 2 Million per year (10% wholesale electricity market increment) to USD 4 Million per year (20% wholesale electricity market increment). Increment gas natural demand: It is difficult to estimate the positive impact for the company, given the different markets where natural gas is sold. Nevertheless, every increase of 0.1 USD$/Mbtu in the final price, would mean a profit of USD 95 million (taking into account Repsol´s natural gas production in 2016)	companies in different areas, including natural gas developments: -Contributing to increasing the share of gas in the global energy mix -Ensuring the natural gas we provide for power generation results in significantly lower life cycle emissions than other fossil fuels -Reducing CH4 emissions from our operations In 2016 we joined to the Climate and Clean Air Coalition Oil & Gas Methane Partnership initiative, to implement CH4 emission reduction projects in collaboration with other companies, institutions and governments. We seek to eliminate barriers and come up with technical and economically viable solutions. This endorsement is fully aligned with our policies and commitment as part of the OGCI to reduce	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	the role of natural gas in the near future. In addition, Gas Natural Fenosa is a strategic stakeholding in which Repsol has a non-operated participation of 20%. Its core businesses are the complete gas life cycle, and the generation, distribution and commercialization of electricity. Being natural gas the fossil fuel with less CO2 emissions, Repsol would be able to provide more energy with less CO2 emissions than its competitors, increasing its revenues.							CH4 emissions from our upstream activities; we have established our Environmental Performance Practices. E&P existing facilities programs for the VOC Leak Detection and Repair (known as LDAR, SMART LDAR or LDAR HYBRID) should be implemented to detect leaks and proceed to their repair. These Leak Detection and Repair technologies are also applied in the our downstream facilities	
Other physical climate opportunities	The change in physical climate parameters is raising new demand for new market niches. Due to we have been working for many years on energy efficiency actions (a reduction of 4.3 MtCO2 has been achieved for the period 2006-2016) we have a lot of knowledge and background in energy efficiency solutions. We are also working for the future, developing new	Increased demand for existing products/services	>6 years	Direct	Likely	Medium	Offering advisory services to our clients, the demand for our products may increase. Repsol can observe that an increase of 1% in the demand of our products and services would be approximately USD 90 Million per year. This estimation has been done including the downstream products, considering	Collaboration with our clients to provide them solutions with the maximum energy efficiency is already a priority for the LPG sales area. Through our programs “Personalized home plan” or “SolarGas” (with combines solar energy solutions with gas), customers will not only see their energy needs met with an emission-low	Repsol's economic contribution to implementation of improvements with efficient and sustainable solutions in our clients is about USD 400,000. To provide innovative services to our LPG clients, we have a specific department in our company structure. There are two people responsible for the

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	technologies and exploring new business models. More precisely, we have in our LPG business units new business model in force, trying to take advantage of our energy background. Our large knowledge on reducing CO2 emissions can be an opportunity for Repsol. We can use our expertise to collaborate with our clients to provide them solutions with the maximum energy efficiency.						the figures of the reporting year.	supply, but can also accede to energy efficiency advisory services to create a personalized design of the facility and select the best available technology. With SolarGas, estimated savings in gas consumption can reach 23%, thus reducing associated CO2 emissions.	management of this issue. Considering 100 USD/h, the cost of management is USD 300,000 per year. In addition, costs of external collaborators in consultancy and implementation are about USD 35,000 per year.
Change in precipitation extremes and droughts	Water scarcity potentially caused by increased incidence of drought may be an opportunity for Repsol to developed new advanced biofuels. A great deal of water is required to produce fuel from biologic feedstock. With an ever increasing population, limited supplies of clean and fresh water, and increasing energy demands, the sustainability of biofuels is in question if requirements for water	Increased demand for existing products/services	>6 years	Direct	More likely than not	Medium	Water scarcity may suppose an increase in the biofuels manufacture cost. Despite of this, we will have to be able to continue incorporating biofuels in our gasolines and diesels in order to comply with the law. Increment of cost are estimated in USD 30 Million if costs of biofuels increase 20%.Advanced biofuels could contribute to avoid	Repsol follows two lines of action in the area of biofuel manufacturing: - The promotion of advanced biofuel projects (from non-food raw materials, biomass) with strong technological development and heightened sustainability. Although we have currently not started production on this type of biofuel, at Repsol Technology Centre we have projects in the	Repsol Technology Centre sets annual budgets for product and process R&D, which include dedicated areas for biofuels. During 2016, approximately USD 1.8 Million have been invested in biofuels.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	cannot be decreased. The vast majority of the water used to produce biofuels is consumed during agricultural steps. Due to this, certain biofuel feedstock cannot be used to sustainably produce biofuels. Some feedstock, like cellulosic feedstock (generally just left over after food crops are harvested) uses much less water, but nowadays cannot be obtained on a large-enough scale to meet current fuel demands. The AR5 explains that there is a tendency for drying of the mid-continental areas during summer, indicating a greater risk of droughts in those regions. Changes in precipitation extremes and droughts caused by climate change could increase the number of our areas located in water stress areas or aggravate the magnitude of this impact in those that are currently affected by this risk. As a result, using biofuels to reduce greenhouse gas						this scarcity in the market and biofuels could be produced in an affordable way.	development phase both for biotechnology processes (advanced fermentation) as well as thermochemical processes (pyrolysis and processing in refinery units) - The production of Hydrotreated Vegetable Oil (HVO) and hydrobiodiesel in our refineries. This is a vegetable oil obtained from oleaginous seeds treated with hydrogen that is used to make gasoil These two lines of action help to reduce CO2 emissions without increasing water withdrawal. To guarantee sustainability of our biofuels, we follow international schemes that certify the traceability of the raw materials included throughout the production chain. Specifically, our facilities are operating under the International Sustainability & Carbon Certification (ISCC) and RED	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	emissions may be only possible developing advanced biofuels that don't require so high quantity of water. This can be an opportunity for Repsol because our Research and Development Center is already working on developing advance biofuels.							Bioenergy Sustainability Assurance (RBSA) schemes. As an example, in 2016, we continued our Bottom-Up Synthetic Biology project, which involves research in advanced biofuel production from renewable raw materials, such as lignocellulosic biomass, which would result in reducing carbon footprint in comparison with fossil fuels.	

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Please describe your inherent opportunities that are driven by changes in other climate-related developments

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Other drivers	Products/services market opportunities: New and innovative products would be required to tackle the climate change issue. This is an opportunity for Repsol since it is possible to create in the long term new business lines associated to low emission products and services. We endeavor	New products/business services	1 to 3 years	Direct	Virtually certain	Medium-high	The improvement of overall reputation may lead to an increased attractiveness of our products as automotive and industrial fuels as a result of many factors including changing consumer behavior, improving brand image and	We encourage innovation, development and research in different fields: - Catalysts and processes for the use of CO2 as a raw material for polymers, the development of eco-design methodology and its application to new polymer materials, and the industrial demonstration of an	Repsol has invested during 2016 around USD 60 million in alternatives energies, and USD 0.5 Million to promote the electric mobility through IBIL. Repsol Technology Centre sets annual budgets for product and process R&D, which include

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	to promote, boost and provide business grounding to new initiatives that contribute to a more diversified future energy mix with lower CO2 emissions and for that we have an R&D department working in different projects. The Department of Emerging Business boosts and reinforces our R&D and demonstration projects on eco desing amongst others. We direct our efforts not only reducing the energy intensity of our productive processes and facilities but also to the design of products that reduce GHG emissions when used. Our Repsol Technology Center uses research, development and innovation to improve and continually reduce emission intensity throughout the value chain. This enables a reduction in our customers' carbon footprint during the						differentiation of competitors. Possible financial implication are difficult to quantify, but we can observe that an increase of 1% in the products sold would have an estimated financial implications of about USD 90 Million per year (considering the downstream figures of the reporting year).	alternative catalyst formulation for the manufacture of polypropylene that is more environmentally friendly are some projects carried out in our chemical facilities. - We continued to promote electrical mobility through IBIL, where we provide an integral recharging service based on 100% renewable energy. We now have 859 recharging stations operational. - We carry out research and generate technologies to help electric car batteries charge more rapidly and last longer. One of our latest initiatives in this area is a project with CIDETEC to come up with technologies with high improvement potential compared to the systems currently available. - We promote the use of autogas in direct injection liquid phase engines. AutoGas is the most widely used alternative car fuel, and it produces fuel savings of up to 40%. We now have	dedicated areas for low carbon activities. During 2016, approximately USD 12.5 Million have been invested in GHG reduction emissions R&D, in the following fields: - Biofuels R&D: USD 1.8 Million - Biomass R&D: USD 0.1 Million - Renewable energy (excluding Biofuels and biomass): USD 0.1 Million - Electric vehicle R&D: USD 0.3 Million - Energy efficiency R&D: USD 10.2 Million In 2016, the investment required for implementing the emissions reduction activities in our facilities was around USD 60 million.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	transformation or use of the products we market. We are working in different fields related with green asphalts, fuels and lubricants. The research strategy into asphalts is based on the development of eco-efficient processes and products, considering improvements not only during the manufacturing phase but also during their use, reducing CO2e emissions during road construction and road recycling, through a reduction in the consumption of fuels and raw materials, on reducing the working temperature and the amount of smoke generated. On engines and energy for transport, technology prospecting is the starting point for developing new products and adapting existing products, in order to evolve, hand-in-hand with the automobile industry,							745 AutoGas supply points, and are gradually extending our network. - We have designed a micro-organism based on a new synthetic metabolic route, for the generation of new advanced biofuels. - The heating gas project Eco Energy, combined with state-of-the-art boilers, can yield levels of NOx emissions that are similar to those of natural gas boilers.	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	towards sustainable transport.								
Other drivers	Searching other financing sources for low emissions projects. Green Bond market aims to enable and develop the key role debt markets can play in funding projects that contribute to environmental benefits. Green Bonds are any type of bond instrument where the proceeds will be exclusively applied to finance or re-finance new and/ or existing eligible Green Bond Projects such as renewable energy, energy efficiency; pollution prevention and control; terrestrial and aquatic biodiversity conservation or climate change adaptation among others. They are intended for use by market participants and are designed to drive the provision of information needed to increase capital allocation to such projects. With a focus on the use of proceeds,	Investment opportunities	3 to 6 years	Direct	Likely	High	OECD estimated that the green bond market could increase to $4.7 trillion to $5.6 trillion in outstanding bonds by 2035, with annual issuances of $620 billion to $720 billion. Green Bonds can advance adoption of innovative new technologies, finance projects that provide green jobs, and promote economic and climate resiliency across regions. Green bonds are an excellent way to secure large amounts of capital to support environmental investments that may not otherwise be available, or that may be uneconomic using more expensive capital. Green bonds are well suited for large-scale sustainability	We have established a framework of eligible projects to avoid GHG emissions through the implementation of energy efficiency and low emissions technology investments that contribute to energy efficiency and the climate change mitigation. The investments projects must have a positive environmental impact (avoidance of GHG emissions) and shall be aligned with Repsol sustainability policies to be selected as eligible. The eligible projects are part of an active plan to avoid 1.9 million of tons of GHG emissions annual run rate by 2020. This bond complies with the Green Bond Principles (GBP) in its four core components: 1.Use of Proceeds: Repsol will allocate the proceeds of the bond to finance and refinance eligible projects aimed to avoid GHG emissions 2.Process for Project Evaluation and	Repsol issued a certified Green Bond to fund more than 300 energy efficiency projects, capturing 500 million euros of investment to cut emissions by improving efficiency through innovation and technology. Repsol commits to allocate the proceeds of a given Green Bond issuance within a three-year period from the issue date of the Green Bond issuance. The share of refinancing will not exceed a 55% of the proceeds

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	the Green Bonds Principles aim to support issuers in transitioning their business model towards greater environmental sustainability through specific projects. Source: The Green Bond Principles 2017 (ICMA) With the issuance of a Green Bond, Repsol reinforces its commitment with Corporate and Social Responsibility demonstrating its investment in sustainable purposes. Repsol is convinced that innovation and technological development are essential for ensuring reliable and sustainable supply in the long term. That is why; financing our projects with a green bond we are contributing to a low emissions future.						projects such as wind and solar development, which often require capital investment ahead of revenues, and which generate modest revenue over a longer investment horizon. More precisely, for Repsol this Green Bond is an opportunity to improve its financing costs. An improvement in the interest rate by a total of 100 basis points could imply savings of USD 5.5 Million.	Selection: Repsol will outline a process to determine the eligible projects, the related eligibility and the environmental, social and governance (ESG) criteria 3.Management of Proceeds:The use of proceeds will be allocated to the eligible projects selected 4.Reporting:Repsol will publish a an annual basis report verified by an external auditor, disclosing: the expenditure commitments of the eligible projects and the absolute GHG emissions avoidance arising from these eligible projects for each category on an aggregate basis by technical typologies and activity An ESG agency has certificated the integrity of the requirements and evaluation of the selected projects issuing an external opinion.	
Reputation	GHG emissions offsetting. As well as promoting initiatives that reduce carbon intensity throughout the	Increased demand for existing products/services	1 to 3 years	Direct	Likely	Low-medium	The improvement of overall reputation may lead to an increased attractiveness of our	Repsol carries out different offsetting activities to compensate the impacts on climate on particular activities	The cost of emissions compensation in 2016 has been over USD 20,000

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	production processes, our carbon strategy also includes offsetting actions for the carbon footprint of some activities and events. Once the associated footprint is measured and the relevant reduction measures have been applied, there is also the possibility of offsetting the remaining GHG emissions to help struggle against climate change. Repsol carries out different offsetting activities to neutralize the impacts on climate on particular activities alongside emission reduction projects.						products as a result of many factors including changing consumer behavior, improving brand image and differentiation of competitors. Possible financial implications are difficult to quantify, but we can observe that an increase of 1% in the products sold would have an estimated financial implications of about USD 90 Million per year (considering the downstream figures of the reporting year).	alongside emission reduction projects. We work together with the Public Relations and Event department for the offsetting of the GHG emissions of events. In 2016, we offset the CO2 emissions associated with holding the General Shareholders' Meeting (64 tons CO2), the participation of the Repsol Team in the MotoGP World Championship (2,222 tons CO2) and our organization and participation in the Spanish Motorcycle Speed Championship (592 tons CO2). A total of 2878 tons of CO2 was offset. Repsol has verified the tons of CO2 of each event with an independent entity.	
Reputation	Repsol promotes initiatives to reduce the intensity of carbon throughout the productive process, including the activities of our suppliers and clients, and throughout the life cycle of our products. Low emission	Investment opportunities	1 to 3 years	Direct	Virtually certain	Low	There are direct and measurable financial implications associated with the success of the Clima projects in our low emission initiatives. Repsol has obtained almost USD 2600 in 2016 from the	Our company identifies opportunities, promotes projects and implements business initiatives in the transport sector: - We promote electrical mobility through IBIL, where we provide an integral recharging service based on 100%	The investment provided since the start of the IBIL project has amounted to USD 8 Million. In 2016, we invested approximately USD 0.5 Million to promote the electric

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	projects that meet the specifications established by the Spanish Ministry of Agriculture, Food and the Environment are managed and verified as “Clima Projects”. “Clima Projects” seek to promote greenhouse gas emissions reductions in the diffuse sector (i.e. transport) throughout Spain. Repsol’s Electric Car Project, operated by IBIL, has been selected for the third consecutive year as a CLIMA project. This project was able to reduce CO2 by 330 tons in 2016, which were verified for the Ministry by an accredited entity in May of this year. We have 859 operational public and private charging points, and we continue to consolidate the fast-charging infrastructure for electric vehicles in Repsol Group service stations. Additionally, we have continued with the CLIMA project to						approved Clima Project. On the other hand, Reputational benefits are difficult to estimate.	renewable energy. We now have 859 recharging stations. - We carry out research and generate technologies to help electric car batteries charge more rapidly and last longer. - We promote the use of autogas in direct injection liquid phase engines. AutoGas is the most widely used alternative car fuel, and it produces fuel savings of up to 40%. We now have 745 AutoGas supply points, and are gradually extending our network. - We have designed a micro-organism based on a new synthetic metabolic route, for the generation of new advanced biofuels. Repsol manages all these opportunities through our Carbon strategy and the collaboration of the different Business Unit, the Sustainability Division and our R&D Department. Prospection studies of energy for transport enable us to anticipate technological changes. This allows us to define R&D projects that help us analyze the	mobility through IBIL. Repsol Technology Centre sets annual budgets for product and process R&D, which include dedicated areas for low emission activities. During 2016, USD 0.3 Million have been invested in Electric vehicle R&D, USD 0.1 Million in renewable energy and USD 1.8 Million in biofuels R&D.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	foster a modal change from road to rail transport at Repsol. This project was able to reduce CO2 emissions by 66 tons in 2016. Its aim is to group together initiatives relating to product logistics that aim to replace road transport with rail transport. Repsol acts as manager and coordinator for initiatives, organizing the follow up and monitoring of the data required carrying out GHG emission reduction calculations. The Ministry will also purchase the GHG emission reductions generated over the next few years.							competitiveness of new propulsion systems in conjunction with different energy sources (fossil fuels and renewables) and identify the most efficient and economically sustainable solutions.	
Reputation	New initiatives which can result in a future new regulation regarding both corporate and product carbon footprint are arising at national and European Union level. Sustainability Division worked together with the Commission's JRC IES and other European	Increased demand for existing products/services	1 to 3 years	Direct	Likely	Low	The improvement of overall reputation may lead to an increased attractiveness of our products as automotive and industrial fuels as a result of many factors including changing consumer behavior, improving	Repsol participates through O&G sectorial association in the 3 years testing period to develop product and sector specific rules for the development of a harmonized methodology for the calculation of the environmental footprint of companies and products launched by the	To cover all the activities related with the opportunity we dedicate ¼ full-time worker (FTE) (estimated in USD 37,500, considering 100 USD/h)

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Commission services towards the development of a harmonized methodology for the calculation of the environmental footprint of companies and products (including carbon footprint). The final methodological guidelines finalized in 2012. A three year pilot phase was launched in 2013 to test methodology. Additionally, the Spanish Ministry of Agriculture, Food and Environment has launched the “Royal Decree Carbon Footprint” which creates the National Register of carbon footprint, carbon offsetting and carbon dioxide absorption projects. From now on the national companies may calculate their carbon footprint and register it voluntarily. This register will consist of three sections: 1) the first will include companies that						brand image and differentiation of competitors. Possible financial implications are difficult to quantify, but we can observe that an increase of 1% in the products sold would have an estimated financial implications of about USD 90 Million per year (considering downstream figures of the reporting year).	European Commission. We also participated in the Carbon Footprint Working Group with the Spanish Confederation of Business Organizations (CEOE) in the development of the Royal Decree of Carbon Footprint . Additionally, our Sustainability Division works with all the business Units to calculate the corporate and product footprints, establishing the most appropriate methodology. A sensitive analysis of the allocation methodology of our carbon footprint calculation methodology has been made. In 2016 the Sustainability Division has updated the Carbon footprint calculations of the products inside the scope of the project.	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	calculate their footprint voluntarily and obtain the accreditation stamp 2) the second will consist of companies and organizations that have forestry projects in Spain 3) the third will include those companies that offset their carbon footprint through forest sinks. Repsol is already evaluating how these initiatives and the associated future new regulation would affect the products that Repsol is commercializing. Our strategy promotes initiatives that reduce the intensity of carbon throughout the lifecycle of our products. Our goal is to have a footprint for the entire company, this entails extending the scope of emissions inventories to include suppliers, customers and our own activities. We are also committed to making progress in calculating the carbon footprint of our products by establishing the most								

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	appropriate methodology for calculation. All these lines of work, already under way, will give us a competitive advantage for selling our products in the future and improve our overall reputation with different stakeholders (consumers, investors, policymakers, etc) that has an influence on the market valuation. The potential impact of this opportunity involves an increased demand for existing and new products and services provided by Repsol.								
Reputation	O&G tracking: Increasingly, our stakeholders demand more information related to climate change, claiming for higher disclosure about our risk management. Investors are each time more interested in this information to take decisions. Aiming for A coalition is an initiative related to this, which uses CDP performance bands and sector	Other: Transparency	1 to 3 years	Direct	Likely	Unknown	Possible financial implication is difficult to quantify. It is important to highlight that the total number of shares in our shareholders' equity managed under sustainability criteria represents nowadays the 12% of the total shares held by our institutional investor	We disclose our climate change management through our Management Reports, our Sustainability Reports, our website and our public response to CDP. Repsol has been recognized as one of the best O&G companies for its Carbon Strategy. In 2016, Repsol achieved one of the highest scores and attained the leadership band for its climate change strategy,	We plan to invest around USD 550 Million in 2011-2020 through our GHG reduction emissions & energy efficiency plans in our refining & chemical facilities. We invested around USD 60 million in alternative energies and USD 0.5 Million to promote the electric mobility through IBIL. Our

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	analysis as an initial benchmark. The 'Aiming for A' investor coalition is calling for the companies to make a step change in their disclosure to investors about their response to the challenges posed to their businesses by the global drive to mitigate climate change. The 'A' within 'Aiming for A' refers to the best A-E CDP (formerly Carbon Disclosure Project) performance band. Within the scoring methodology considerable weight is given to operational emissions management, alongside the strategic and governance issues covered in the shareholder resolutions. Repsol is recognized as one of the best O&G companies for its Carbon Strategy.							with an A- score, according to the Carbon Disclosure Project (CDP) sustainability index. Our methodology for the assessment of the risks implied by climate change, the quality and effectiveness of our energy efficiency plans and our transparency in the GHG emissions have been highly valuated in the last years. As an additional evidence to our commitment to climate change, Repsol is part of the Oil and Gas Climate Initiative (OGCI), an organization that brings together ten of the sector's most important companies on a global scale, providing a fifth of the world's total gas and oil production, and nearly 10% of the world's energy needs. Josu Jon Imaz, the company's CEO, has signed the membership and leads the commitment to these topics. The goal of this voluntary initiative is to share best practices and technology solutions between members in	Technology Centre sets annual budgets for product and process R&D which include areas for low carbon activities. In 2016, around USD 12.5 Million were invested in GHG reduction emissions R&D: -Biofuels: USD 1.8 Million -Biomass: USD 0.1 Million -Renewable energy (excluding Biofuels and biomass): USD 0.1 Million -Electric vehicle: USD 0.3 Million -Energy efficiency: USD 10.2 Million To boost the fight against climate change, in 2016 we invested USD 100,000 in Low Carbon Technology studies through the Oil & Gas Climate Initiative (OGCI). OGCI also created a fund (OGCI Climate Investment)to invest US$1 billion over 10 years to develop and accelerate the

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								order to coordinate our actions and strengthen our investments, thereby accelerating the fight against climate change.	commercial deployment of low-emission technologies.

Further Information

Module: GHG Emissions Accounting, Energy and Fuel Use, and Trading

Page: CC7. Emissions Methodology

CC7.1

Please provide your base year and base year emissions (Scopes 1 and 2)

Scope	Base year	Base year emissions (metric tonnes CO2e)
Scope 1	Fri 01 Jan 2010 - Fri 31 Dec 2010	12690665
Scope 2 (location-based)	Fri 01 Jan 2010 - Fri 31 Dec 2010	971566
Scope 2 (market-based)	Fri 01 Jan 2010 - Fri 31 Dec 2010	971566

CC7.2

Please give the name of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions

Please select the published methodologies that you use
ISO 14064-1
IPIECA's Petroleum Industry Guidelines for reporting GHG emissions, 2nd edition, 2011
American Petroleum Institute Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry, 2009
Defra Voluntary Reporting Guidelines
European Union Emission Trading System (EU ETS): The Monitoring and Reporting Regulation (MMR) – General guidance for installations
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

CC7.2a

If you have selected "Other" in CC7.2 please provide details of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions

CC7.3

Please give the source for the global warming potentials you have used

Gas	Reference
CO2	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	IPCC Fourth Assessment Report (AR4 - 100 year)

Gas	Reference
N2O	IPCC Fourth Assessment Report (AR4 - 100 year)

CC7.4

Please give the emissions factors you have applied and their origin; alternatively, please attach an Excel spreadsheet with this data at the bottom of this page

Fuel/Material/Energy	Emission Factor	Unit	Reference
Motor gasoline	0.07	metric tonnes CO2e per GJ	Guidelines for National Greenhouse Gas Inventory. Intergovernmental Panel on Climate Change (IPCC)
Naphtha	0.07	metric tonnes CO2e per GJ	Guidelines for National Greenhouse Gas Inventory. Intergovernmental Panel on Climate Change (IPCC)
Distillate fuel oil No 4	0.08	metric tonnes CO2e per GJ	Compendium of Greenhouse Gas Emissions Estimation Methodologies for the Oil and Gas Industry. American Petroleum Institute (API).
Diesel/Gas oil	0.07	metric tonnes CO2e per GJ	Corine- Air.1997-2000 Report. Refining Sector.
Natural gas	0.06	metric tonnes CO2e per GJ	Compendium of Greenhouse Gas Emissions Estimation Methodologies for the Oil and Gas Industry. American Petroleum Institute (API).
Liquefied petroleum gas (LPG)	0.06	metric tonnes CO2e per GJ	Compendium of Greenhouse Gas Emissions Estimation Methodologies for the Oil and Gas Industry. American Petroleum Institute (API).
Propane	0.06	metric tonnes CO2e per GJ	Compendium of Greenhouse Gas Emissions Estimation Methodologies for the Oil and Gas Industry. American Petroleum Institute (API).
Butane	0.06	metric tonnes CO2e per GJ	Compendium of Greenhouse Gas Emissions Estimation Methodologies for the Oil and Gas Industry. American Petroleum Institute (API).
Other: Steam (Spain)	0.06	metric tonnes CO2e per GJ	Emission factor for the steam purchased to third parties is calculated assuming the steam is generated in a boiler using natural gas. The efficiency of the boiler is as set in API Compendium of GHG Emissions Estimation Methodologies for the Oil and Gas Industry and the natural gas emission factor is the one set by the Intergovernmental Panel on Climate Chance guidelines for GHG national inventories for Spain
Other: Steam (Portugal)	0.06	metric tonnes CO2e per GJ	Emission factor for the steam purchased to third parties is calculated assuming the steam is generated in a boiler using natural gas. The efficiency of the boiler is as set in API Compendium of GHG Emissions Estimation Methodologies for the Oil and Gas Industry and the natural gas emission factor is the one set by the Intergovernmental Panel on Climate Chance guidelines for GHG national inventories for Portugal, Peru and Ecuador
Other: Hydrogen (Spain)	6.90	Other: Tonnes CO2e per tonnes Hydrogen	Repsol's GHG inventories include indirect CO2 emissions resulting from the production of hydrogen purchased by Repsol and distributed to the various oil refineries and chemicals. Emission factors for hydrogen acquisition: 6.90 tCO2/tH2 for Spain. The emission factors for hydrogen acquisition is the sum of two components: 1. Reaction component: the raw material used is 100% methane natural gas, with 100% H2 recovery and 100% conversion to CO2 (vapour reforming reaction: CH4 + H2O → CO + 3H2, displacement reaction of water vapour: CO + H2O → CO2 + H2), implying process emissions of 5.50 tCO2/tH2. 2. Necessary energy component: The fuel used in the reforming furnaces is natural gas, at a rate of 25,000 MJ/tH2 (a). The natural gas emission factor will be used following the GHG emissions National Inventory in case of Spain.(a)

Fuel/Material/Energy	Emission Factor	Unit	Reference
			Average value taken from the BREF of refineries, Integrated Pollution Prevention and Control (IPPC) -reference document on best available techniques for mineral oil and gas refineries, 2015
Other: Hydrogen (Portugal)	6.90	Other: Tonnes CO2e per tonnes Hydrogen	Repsol's GHG inventories include indirect CO2 emissions resulting from the production of hydrogen purchased by Repsol and distributed to the various oil refineries and chemicals.Emission factors for hydrogen acquisition: 6.90 tCO2/tH2 for Portugal. The emission factors for hydrogen acquisition is the sum of two components: 1. Reaction component: the raw material used is 100% methane natural gas, with 100% H2 recovery and 100% conversion to CO2 (vapour reforming reaction: CH4 + H2O → CO + 3H2, displacement reaction of water vapour: CO + H2O → CO2 + H2), implying process emissions of 5.50 tCO2/tH2.2. Necessary energy component: The fuel used in the reforming furnaces is natural gas, at a rate of 25,000 MJ/tH2 (a). The natural gas emission factor will be used following the IPPC guidelines for national GHG inventories in case of Portugal. (a) Average value taken from the BREF of refineries, Integrated Pollution Prevention and Control (IPPC) -reference document on best available techniques for mineral oil and gas refineries, 2015
Other: Electricity (Spain)	0.32	metric tonnes CO2e per MWh	The located based emission factor for the electricity purchased to third parties is calculated based on the 2015 published information by Red Eléctrica Española (REE) of Spain regarding national energy balances (located factors were needed prior to the publication of the 2016 report for ISO-14064 certification audits carried out between January and March of 2017). The market based emission factors for the electricity purchased to third parties is calculated based on the last published information by CNMC of Spain. The located based emission factor is 0.3187 metric tonnes CO2e per MWh.The market based factors used depends on the electricity marketing company: Gas Natural: 0.29 metric tonnes CO2e per MWh, EDP: 0.24 metric tonnes CO2e per MWh, Iberdrola: 0.15 metric tonnes CO2e per MWh, Endesa: 0.34 metric tonnes CO2e per MWh.
Other: Electricity (Portugal)	0.41	metric tonnes CO2e per MWh	Emission factor for the electricity purchased to third parties is calculated based on the published information by Red Eléctrica Nacional (REN) of Portugal regarding national energy balances.(The last information available prior to ISO-14064 certification audits carried out between January and March of 2017)
Other: Electricity (Peru)	0.24	metric tonnes CO2e per MWh	Emission factor for the electricity purchased to third parties is calculated based on the published information by the Comité de Operaciones Económicas del Sistema Interconectado Nacional (COES-SINAC) of Peru regarding national energy balances. (The last information available prior to ISO-14064 certification audits carried out between January and March of 2017).
Other: Electricity (Ecuador)	0.43	metric tonnes CO2 per MWh	Emission factor for the electricity purchased to third parties is calculated based on the published information by the Consejo Nacional de Electricidad of Ecuador regarding national energy balances. (The last information available prior to ISO-14064 certification audits carried out between January and March of 2017).
Other: Electricity (Bolivia)	0.46	metric tonnes CO2e per MWh	Emission factor for the electricity purchased to third parties is calculated based on the published information by the International Energy Agency regarding national energy balances (the last information available prior to ISO-14064 certification audits carried out between January and March of 2017).
Other: Electricity (Trinidad and Tobago)	0.72	metric tonnes CO2 per MWh	Emission factor for the electricity purchased to third parties is calculated based on the published information by the International Energy Agency regarding national energy balances. (The last information available prior to ISO-14064 certification audits carried out between January and March of 2017).
Other: Electricity (Canada)	0.82	metric tonnes CO2e per MWh	Emission factor for the electricity purchased to third parties is calculated based on the published information by the International Energy Agency regarding national energy balances. (The last information available prior to ISO-14064 certification audits carried out between January and March of 2017)

Fuel/Material/Energy	Emission Factor	Unit	Reference
Other: Electricity (Malaysia)	0.82	metric tonnes CO2e per MWh	Emission factor for the electricity purchased to third parties is calculated based on the last published information by the International Energy Agency regarding national energy balances.
Other: Electricity (USA)	0.55	metric tonnes CO2e per MWh	Emission factor for the electricity purchased to third parties is calculated based on the published information by the International Energy Agency regarding national energy balances. (The last information available prior to ISO-14064 certification audits carried out between January and March of 2017)
Other: Electricity (Malaysia)	0.82	metric tonnes CO2e per MWh	Emission factor for the electricity purchased to third parties is calculated based on the published information by the International Energy Agency regarding national energy balances (the last information available prior to ISO-14064 certification audits carried out between January and March of 2017).

Further Information

(Q 7.1) In 2015, Repsol acquired the Canadian oil company Talisman Energy Inc. The based year emissions including 2016 Talisman GHG emissions (2016 was the first entire year that Repsol manage Talisman Energy Inc.) are 24,866,434 tCO2 (Scope 1: 23,769,937 tCO2e and Scope 1,096,497 tCO2e). Currently, Repsol has included Legacy Talisman assets in their Energy Efficiency Management, searching emission reduction initiatives and evaluating deeply all the opportunities. (Q 7.3) The global warming potentials used for the conversion to tons of equivalent CO2 have been updated in 2016, based on the information published in the fourth report of the Intergovernmental Panel on Climate Change (IPCC) to align with the most common use reference in the sector. (Q 7.4) Last CNMC report of Spain is attached

Attachments

GarantiasEtiquetadoElectricidad2016.pdf

Page: CC8. Emissions Data - (1 Jan 2016 - 31 Dec 2016)

CC8.1

Please select the boundary you are using for your Scope 1 and 2 greenhouse gas inventory

Operational control

CC8.2

Please provide your gross global Scope 1 emissions figures in metric tonnes CO2e

24884761

CC8.3

Please describe your approach to reporting Scope 2 emissions

Scope 2, location-based	Scope 2, market-based	Comment
We are reporting a Scope 2, location-based figure	We are reporting a Scope 2, market-based figure	We are reporting a Sciope 2 location-based and a market-based figures following this criteria: The located based emission factor for the electricity purchased to third parties is calculated based on the 2015 published information by Red Eléctrica Española (REE) of Spain regarding national energy balances (located factors were needed prior to the publication of the 2016 report for ISO-14064 certification audits carried out between January and March of 2017). The market based emission factors for the electricity purchased to third parties is calculated based on the last published information by CNMC of Spain. The located based emission factor is 0.3187 metric tonnes CO2e per MWh. The market based factors used depends on the electricity marketing company: Gas Natural: 0.29 metric tonnes CO2e per MWh, EDP: 0.24 metric tonnes CO2e per MWh, Iberdrola: 0.15 metric tonnes CO2e per MWh, Endesa: 0.34 metric tonnes CO2e per MWh.

CC8.3a

Please provide your gross global Scope 2 emissions figures in metric tonnes CO2e

Scope 2, location-based	Scope 2, market-based (if applicable)	Comment
663744	649743	

CC8.4
Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?
Yes

CC8.4a
Please provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure

Source	Relevance of Scope 1 emissions from this source	Relevance of location-based Scope 2 emissions from this source	Relevance of market-based Scope 2 emissions from this source (if applicable)	Explain why the source is excluded
Offices located outside industrial sites with the exception of Madrid headquarters Campus, IT Building (Tres Cantos) and the Tecnology Center.	Emissions are not relevant	Emissions are not relevant	Emissions are not relevant	Scope 1 and 2 emissions from offices located outside industrial facilities are not included within the operational boundary based on the oil industry guidelines for the reporting of greenhouse gas emissions developed by IPIECA, IOGP and API. During 2016, Campus headquarter, Tres Cantos building (where the Company's main Data Processing Center is located) and the Tecnology Center verified their emissions following ISO 14064 standard.
Temporary activities	Emissions are not relevant	Emissions are not relevant	Emissions are not relevant	Temporary activities (less than 6 months and less than 5% of the total GHG inventory).

CC8.5
Please estimate the level of uncertainty of the total gross global Scope 1 and 2 emissions figures that you have supplied and specify the sources of uncertainty in your data gathering, handling and calculations

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
Scope 1	Less than or equal to 2%	Assumptions Metering/ Measurement Constraints Data Management	The main sources of uncertainty are: - Completeness: To make sure not to leave out any GHG emission source, Repsol works in the consolidation of its inventory from the corporation, evaluating the individual GHG inventories of each of its business units world-wide. The annual third party verification (performed in 2016 by Deloitte), guarantees the completeness of the GHG Inventory. - Information management: The significant heterogeneity of Repsol's activities also implies that the inventory data management varies across activities. The third party verification undertaken by Repsol focuses, to a large extent, on information management and provides Repsol with assurance that its systems and procedures minimise errors in data gathering and handling. - Generic emission factors: Repsol is making a big effort moving away from generic emission factors towards the use of fuel specific chromatograph based factors, set in Repsol's laboratories. Repsol has a big laboratory network that allows performing frequent counter analysis that increases the accuracy of the laboratory methods. - Measurement: The main source of uncertainty of the different facilities is the actual equipment accuracy limits, which are evaluated though strict traceable calibration campaigns. The uncertainty is being evaluated following the IPCC Guidelines for Good Practices and Management of Uncertainties of GHG National Inventories 2000. In

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
			2016, 91% of Scope 1 company emissions were verified according to the international ISO 14064 standard It is also important to highlight that during 2016 Repsol has included Malaysia in the boundary of assets verified under the ISO 14064.The assets under the ISO 14064 verification scope are Refining Spain, Refining Peru, Chemicals, and Upstream assets in Casablanca (Spain), Margarita and Mamoré (Bolivia), Block 16 (Ecuador), and PM3 (Malaysia). Repsol is undertaking an extensive plan to verify the entire Repsol's GHG inventory under the developed ISO 14064 standard. This will allow Repsol to identify the main gaps and establish the best procedures to ensure the accuracy of the GHG inventory.
Scope 2 (location-based)	Less than or equal to 2%	Assumptions Metering/ Measurement Constraints Data Management	The main sources of uncertainty are: - Completeness: To make sure not to leave out any GHG emission source, Repsol works in the consolidation of its inventory from the corporation, evaluating the individual GHG inventories of each of its business units world-wide. The annual third party verification, (performed in 2016 by Deloitte) guarantees the completeness of the GHG Inventory. - Information management: The significant heterogeneity of the Repsol's activities also implies that the inventory data management varies across activities. The third party verification undertaken by Repsol focuses, to a large extent, on information management and provides Repsol with assurance that its systems and procedures minimise errors in data gathering and handling. - Generic emission factors: Repsol is making a big effort moving away from generic emission factors towards the use of fuel specific chromatograph based factors, set in Repsol's laboratories. Repsol has a big laboratory network that allows performing frequent counter analysis that increases the accuracy of the laboratory methods. - Measurement: The main source of uncertainty of the different facilities is the actual equipment accuracy limits, which are evaluated though strict traceable calibration campaigns. The uncertainty is being evaluated following the IPCC Guidelines for Good Practices and Management of Uncertainties of GHG National Inventories 2000. In 2016, 73% of Scope 2 company emissions were verified according to the international ISO 14064 standard. Repsol is undertaking an extensive plan to verify the entire Repsol's GHG inventory under the developed ISO14064 standard. This will allow Repsol to identify the main gaps and establish the best procedures to ensure the accuracy of the GHG inventory.
Scope 2 (market-based)	Less than or equal to 2%	Assumptions Metering/ Measurement Constraints Data Management	The main sources of uncertainty are: - Completeness: To make sure not to leave out any GHG emission source, Repsol works in the consolidation of its inventory from the corporation, evaluating the individual GHG inventories of each of its business units world-wide. The annual third party verification, (performed in 2016 by Deloitte) guarantees the completeness of the GHG Inventory. - Information management: The significant heterogeneity of the Repsol's activities also implies that the inventory data management varies across activities. The third party verification undertaken by Repsol focuses, to a large extent, on information management and provides Repsol with assurance that its systems and procedures minimise errors in data gathering and handling. - Generic emission factors: Repsol is making a big effort moving away from generic emission factors towards the use of fuel specific chromatograph based factors, set in Repsol's laboratories. Repsol has a big laboratory network that allows performing frequent counter analysis that increases the accuracy of the laboratory methods. - Measurement: The main source of uncertainty of the different facilities is the actual equipment accuracy limits, which are evaluated though strict traceable calibration campaigns. The uncertainty is being evaluated following the IPCC Guidelines for Good Practices and Management of Uncertainties of GHG National Inventories 2000. In 2016, 73% of Scope 2 company emissions were verified according to the international ISO 14064 standard.Repsol is undertaking an extensive plan to verify the entire Repsol's GHG inventory under the developed ISO14064 standard. This will allow Repsol to identify the main gaps and establish the best procedures to ensure the accuracy of the GHG inventory.

CC8.6

Please indicate the verification/assurance status that applies to your reported Scope 1 emissions

Third party verification or assurance process in place

CC8.6a

Please provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/section reference	Relevant standard	Proportion of reported Scope 1 emissions verified (%)
Annual process	Complete	Limited assurance	Verification letter and 2016 Sustainability report.zip	The document attached is a zip file that contains: - First folder: "2016 Sustainability report" Page 20: Climate Change/ our emissions / Scope 1. - Second Folder: “Verification letter 2016 Sustainability report” Pages 1-2: Verification letter https://www.repsol.energy/imagenes/global/en/Global_Reporting_Initiative_GRI_index_and_verification_letter_2016_tcm14-63405.pdf	ISAE3000	100
Annual process	Complete	Moderate assurance	Verification letter and 2016 Sustainability report.zip	The document attached is a zip file that contains: - First folder: "2016 Sustainability report" Page 20: Climate Change/ our emissions / Scope 1. - Second Folder: “Verification letter 2016 Sustainability report” Pages 1-2: Verification letter https://www.repsol.energy/imagenes/global/en/Global_Reporting_Initiative_GRI_index_and_verification_letter_2016_tcm14-63405.pdf	AA1000AS	100
Annual process	Complete	Limited assurance	ISO 14064 certificates (scope 1).zip	The document attached is a zip file that contains: - First folder: Chemical facilities (page 1-2). - Second folder-Non industrial facilities: Campus (page 2), Tres Cantos (page 2) and CTR and CSF (page 2). - Third folder-Refining Facilities: Spanish refineries (page 1) and Peru refinery (page 1). - Fourth folder-Upstream assets: Casablanca (page 2), Ecuador (page 2), Mamore (page 2), Margarita (page 2), Malaysia (page 2)	ISO14064-3	91

CC8.7

Please indicate the verification/assurance status that applies to at least one of your reported Scope 2 emissions figures

Third party verification or assurance process in place

CC8.7a

Please provide further details of the verification/assurance undertaken for your location-based and/or market-based Scope 2 emissions, and attach the relevant statements

Location-based or market-based figure?	Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 2 emissions verified (%)
Location-based	Annual process	Complete	Limited assurance	Verification letter and 2016 Sustainability report.zip	The document attached is a zip file that contains: - First folder: "2016 Sustainability report" Page 20: Climate Change/ our emissions / Scope 2. - Second Folder: “Verification letter 2016 Sustainability report” Pages 1-2: Verification letter https://www.repsol.energy/imagenes/global/en/Global_Reporting_Initiative_GRI_index_and_verification_letter_2016_tcm14-63405.pdf	ISAE3000	100
Location-based	Annual process	Complete	Moderate assurance	Verification letter and 2016 Sustainability report.zip	The document attached is a zip file that contains: - First folder: "2016 Sustainability report" Page 20: Climate Change/ our emissions / Scope 2. - Second Folder:“Verification letter 2016 Sustainability report” Pages 1-2: Verification letter https://www.repsol.energy/imagenes/global/en/Global_Reporting_Initiative_GRI_index_and_verification_letter_2016_tcm14-63405.pdf	AA1000AS	100
Location-based	Annual process	Complete	Limited assurance	ISO 14064 certificates (scope 2).zip	The document attached is a zip file that contains: - First folder: Chemical facilities (page 1-2) - Second folder-Non industrial facilities: Campus (page 2), Tres Cantos (page 2) and CTR and CSF (page 2) - Third folder- Refining Facilities: Spanish refineries (page 1) and Peru refinery (page 1) - Fourth folder-Upstream assets: Casablanca (page 2), Ecuador (page 2), Mamore (page 2), Margarita (page 2), Malaysia (Page 2).	ISO14064-3	73

CC8.8

Please identify if any data points have been verified as part of the third party verification work undertaken, other than the verification of emissions figures reported in CC8.6, CC8.7 and CC14.2

Additional data points verified	Comment
Emissions reduction activities	During 2016, we implemented actions that reduce our CO2 emissions in 314,064 tons. Most of the initiatives have been verified according to ISO14064. The reduction was a result of more than 250 investment and operating improvement actions across all the Company's operations. These actions mainly include improvements in energy efficiency through projects such as energy unit integration, steam consumption optimization, improvements in isolation, furnace modifications, residual heat recovery, technological updating of the equipment, installation of variable speed motors, as well as actions to reduce the amount of flared and vented gas. Additionally, Repsol manages its carbon footprint along the entire value chain. In this regard, we have developed two emissions reduction initiatives that reduce our Scope 3 emissions. Both initiatives have been managed and verified as “Clima Projects” following the specifications established by the Spanish Ministry of Agriculture, Food and the Environment. One of these was the “e-mobility activity program”. In 2016, we continued to promote electrical mobility through IBIL. We have 859 operational charging points, and we continue to consolidate the fast-charging infrastructure for electric vehicles in Repsol

Additional data points verified	Comment
	Group service stations. The second one is the “Program of activities to encourage a shift from road transport to rail transport at Repsol”.The total amount of CO2 reduced thanks to these project has been 396 t CO2 in 2016.
Year on year change in emissions (Scope 1)	The change in Scope 1 emissions between years 2006 and 2016 has been reported in our Corporate Responsibility Reports and Sustainability Reports. Deloitte has verified 100% Scope 1 GHG emissions in the 2016 Sustainability Report under AA 1000 Assurance Standard (Moderate assurance) and under ISAE3000 (limited assurance).
Year on year change in emissions (Scope 2)	The change in Scope 2 emissions between years 2006 and 2016 has been reported in our Corporate Responsibility Reports and Sustainability Reports. Deloitte has verified 100% Scope 2 GHG emissions in the 2016 Sustainability Report under AA 1000 Assurance Standard (Moderate assurance) and under ISAE3000 (limited assurance).
Year on year emissions intensity figure	The change in our emission intensity figure between years 2014 and 2016 has been reported in our 2016 Sustainability Report. Deloitte has verified the emission intensity figures reported in the 2016 Sustainability Report under AA 1000 Assurance Standard (Moderate assurance) and under ISAE3000 (limited assurance).
Other: Activities and events footprint verification	Repsol remains committed to offsetting the carbon footprint of some of its activities and events. In 2016, various initiatives and emission-reduction projects were launched to offset the adverse impact on the climate associated with specific activities. These efforts include offsetting the emissions from the General Shareholders' Meeting in 2016 (64 t CO2e), emissions generated by our participation in MotoGP World Championship (Repsol Team participation: 2,221.7 tCO2e) and emissions generated by the organization and participation in the Spanish Motorcycle Speed Championship (591.6 tCO2e). Repsol has verified the tons of CO2 of each event with an independent entity.

CC8.9

Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

No

Further Information

(Q 8.7a): The amount of scope 2 emissions that appears in the certificates attached does not exactly coincide with those reported in CDP2017 because the verification process is carried out locally, and the asset criteria differs from the company criteria. Electricity and steam purchases following the company criteria must always be recalculated to avoid double accounts between business units. (Q 8.8) ISO14064 certificates of our emissions reduction activities are attached. Likewise, we attach the offsetting certificates of General Shareholders' Meeting, MotoGP World Championship and Spanish Motorcycle Speed Championship in 2016. (Q 8.9): We have not reported the CO2 emissions from the bio-ethanol and bio-diesel commercialized in question 8.9 because CO2 emissions don´t occur within your organizational boundary, as defined in question CC8.1. As we reported in question CC3.2a, due to the use of these biofuels marketed, we estimate that 930,000 tons of CO2 emissions were avoided compared to the GHG emissions emitted by the use of an equivalent amount of gasoline and diesel in an energy basis. The emissions saved have been estimated using a methodology developed by Repsol. It is assumed, as indicated FQD, that the average emissions saving capacity is 35% compared to the hypothetical use of conventional fossil fuels. The Net calorific value used for estimating the energy content of the biofuels marketed and the emission factors used to calculate the CO2 emissions from the combustion of the equivalent amount, in energy basis are provided by IPCC Guidelines 2006. The emissions reductions calculated considers only CO2 (UNFCCC’s website global warming potentials (GWP)=1)

Attachments

ISO 14064 certificates (emission reductions).zip

Offsetting certificates 2016.zip

Page: CC9. Scope 1 Emissions Breakdown - (1 Jan 2016 - 31 Dec 2016)

CC9.1

Do you have Scope 1 emissions sources in more than one country?

Yes

CC9.1a

Please break down your total gross global Scope 1 emissions by country/region

Country/Region	Scope 1 metric tonnes CO2e
Algeria	1584
Bolivia	355320
Brazil	31734
Canada	720525
Ecuador	633068
United States of America	665849
Spain	11091732
Malaysia	9662454
Norway	66399
Peru	545833
Portugal	723894
Russia	1844
Trinidad and Tobago	349513
Rest of world	28547
Indonesia	1316
Papua New Guinea	5149

CC9.2

Please indicate which other Scope 1 emissions breakdowns you are able to provide (tick all that apply)

By business division
By facility
By GHG type
By activity

CC9.2a

Please break down your total gross global Scope 1 emissions by business division

Business division	Scope 1 emissions (metric tonnes CO2e)
Refining	8773231
Exploration and Production	12589830
Chemicals	3495551
Marketing	2073
LPG	11134

Business division	Scope 1 emissions (metric tonnes CO2e)
Speciality Operations	8307
Non Industrial Facilities	838
Technology Center	3796

CC9.2b

Please break down your total gross global Scope 1 emissions by facility

Facility	Scope 1 emissions (metric tonnes CO2e)	Latitude	Longitude
Puertollano Refinery (Spain)	1279852		
Tarragona Refinery (Spain)	919054		
Cartagena Refinery (Spain)	2439687		
A Coruña Refinery (Spain)	1214853		
Petronor - Bilbao Refinery (Spain)	2414637		
La Pampilla Refinery (Peru)	505148		
Tarragona Chemical Plant (Spain)	2276694		
Puertollano Chemical Plant (Spain)	308859		
Sines Chemical Plant (Portugal)	721824		
Santander Chemical Plant (Spain)	188174		
Marketing	2073		
Exploration and production Spain	26003		
Exploration and production Algeria	1584		
Exploration and production Trinidad & Tobago	349513		
Exploration and production Ecuador	633040		
Exploration and production Peru	40554		
Exploration and production Bolivia	355320		
Exploration and production Brazil	31734		
Exploration and production USA	665849		
Exploration and production Russia	1844		
Exploration and production Indonesia	1316		
Exploration and production Australia-Papúa NG	5149		
Exploration and production Canada	720525		
Exploration and production Malaysia	9662454		
Exploration and production Norway	66399		
Exploration and production others	28547		

Facility	Scope 1 emissions (metric tonnes CO2e)	Latitude	Longitude
LPG	11134		
Speciality operations Asphalts Mangualde	251		
Speciality operations Palencia	1135		
Speciality operations Bailen	6922		
Technology Center (Spain)	3796		
Non industrial facilities Campus (Spain)	785		
Non industrial facilities Tres Cantos (Spain)	53		

CC9.2c
Please break down your total gross global Scope 1 emissions by GHG type

GHG type	Scope 1 emissions (metric tonnes CO2e)
CO2	19683206
CH4	4963668
N2O	237887

CC9.2d
Please break down your total gross global Scope 1 emissions by activity

Activity	Scope 1 emissions (metric tonnes CO2e)
Exploration, production & gas processing	12589830
Storage, transportation & distribution	11134
Storage, transportation & distribution	3508493
Refining	8773231
Retail &marketing	2073

Further Information
The global warming potentials used for the conversion to tons of equivalent CO2 have been updated in 2016, based on the information published in the fourth report of the Intergovernmental Panel on Climate Change (IPCC) to align with the most common use reference in the sector. In previous years, global warming potentials were based on the information published in the second report of the IPCC.

Page: CC10. Scope 2 Emissions Breakdown - (1 Jan 2016 - 31 Dec 2016)

CC10.1
Do you have Scope 2 emissions sources in more than one country?
Yes

CC10.1a
Please break down your total gross global Scope 2 emissions and energy consumption by country/region

Country/Region	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
Canada	120298	120298	146705	0

Country/Region	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
Ecuador	742	742	1735	0
United States of America	3759	3759	6853	0
Malaysia	873	873	1065	0
Spain	442754	428753	1721466	35643
Peru	13119	13119	54389	0
Portugal	81844	81844	200930	0
Trinidad and Tobago	355	355	494	0

CC10.2

Please indicate which other Scope 2 emissions breakdowns you are able to provide (tick all that apply)

By business division
By facility
By activity

CC10.2a

Please break down your total gross global Scope 2 emissions by business division

Business division	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)
Refining	217365	209851
Exploration & Production	125404	125404
Chemicals	253292	258673
Marketing	38676	38318
LPG	14219	14070
Speciality Operations	3428	3428
Non Industrial Facilities	7269	0
Technology Center	4091	0

CC10.2b

Please break down your total gross global Scope 2 emissions by facility

Facility	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)
Puertollano Refinery (Spain)	75058	75058
Tarragona Refinery (Spain)	64380	64380
Cartagena Refinery (Spain)	37595	30081
A Coruña Refinery (Spain)	31023	31023
La Pampilla Refinery (Peru)	9308	9308

Facility	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)
Polidux Chemical Plant (Spain)	2790	2790
Puertollano Chemical Plant (Spain)	80503	85884
Sines Chemical Plant (Portugal)	77067	77067
Tarragona Chemical Plant (Spain)	33497	33497
Santander Chemical Plant (Spain)	59435	59435
Marketing	38676	38318
Exploration and production Spain	95	95
Exploration and production Trinidad & Tobago	355	355
Exploration and production Ecuador	22	22
Exploration and production Malaysia	873	873
Exploration and production USA	3759	3759
Exploration and production Canada	120298	120298
LPG	14219	14070
Speciality operations Lubricants Puertollano	2133	2133
Speciality operations Asphalts Mangualde	75	75
Speciality operations Palencia	480	480
Speciality operations Bailen	740	740
Technology Center (Spain)	4091	0
Non industrial facilities Campus (Spain)	3746	0
Non industrial facilities Tres Cantos (Spain)	3522	0

CC10.2c

Please break down your total gross global Scope 2 emissions by activity

Activity	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)
Exploration, production & gas processing	125404	125404
Storage, transportation & distribution	14219	14070
Speciality operations	268080	262101
Refining	217365	209851
Retail & marketing	38676	38318

Further Information

(CC10.1a) Technology Center and non industrial facilities of Spain (Campus and Tres Cantos) purchase electricity from renewable sources. We attach the certificates of the guarantees of origin and their ISO14064 certificates. Further details are provided in question 11.4

Attachments

Guarantees of origin certificates.zip
ISO14064 Campus, Tres Cantos and CTR.zip

Page: CC11. Energy

CC11.1
What percentage of your total operational spend in the reporting year was on energy?
More than 5% but less than or equal to 10%

CC11.2
Please state how much heat, steam, and cooling in MWh your organization has purchased and consumed during the reporting year

Energy type	MWh
Heat	0
Steam	1056871
Cooling	0

CC11.3
Please state how much fuel in MWh your organization has consumed (for energy purposes) during the reporting year
63289379

CC11.3a
Please complete the table by breaking down the total "Fuel" figure entered above by fuel type

Fuels	MWh
Diesel/Gas oil	695879
Natural gas	27597851
Distillate fuel oil No 4	1815641
Liquefied petroleum gas (LPG)	30713
Refinery gas	31143389
Other: associated gas, crude oil, etc	2005906

CC11.4
Please provide details of the electricity, heat, steam or cooling amounts that were accounted at a low carbon emission factor in the market-based Scope 2 figure reported in CC8.3a

Basis for applying a low carbon emission factor	MWh consumed associated with low carbon electricity, heat, steam or cooling	Emissions factor (in units of metric tonnes CO2e per MWh)	Comment
Energy attribute certificates, Guarantees of Origin	35643	0	Technology Center and non industrial facilities of Spain (Campus and Tres Cantos) purchase electricity from renewable sources. We attach the certificates of the guarantees of origin.

CC11.5
Please report how much electricity you produce in MWh, and how much electricity you consume in MWh

Total electricity consumed (MWh)	Consumed electricity that is purchased (MWh)	Total electricity produced (MWh)	Total renewable electricity produced (MWh)	Consumed renewable electricity that is produced by company (MWh)	Comment
6566102	1076767	5489335	0	0	

Further Information
The company's energy cost is a percentage between 5 and 10% considering the total costs of the company, including those derived from raw materials. However, its reduction is critical for the company since it is a variable of improving competitiveness and represents a significant percentage of the operating cost of our processes, without consider the purchase of raw materials. We attach the certificates of the guarantees of origin and their ISO 14064 certificates.

Attachments
Guarantees of origin certificates.zip
ISO14064 certificates Campus, Tres Cantos, CTR.zip

Page: CC12. Emissions Performance

CC12.1
How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to the previous year?
Decreased

CC12.1a
Please identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined) and for each of them specify how your emissions compare to the previous year

Reason	Emissions value (percentage)	Direction of change	Please explain and include calculation
Emissions reduction activities	1.45	Decrease	During 2016, we reduced our emissions by 314,064 tons CO2e through specific energy saving and fuel switching actions. This reduction is substantially greater than the objective established for the year (220,000 tons). Our total scope 1 and scope 2 emissions in the previous year were 21,642,680 tCO2e, therefore we have reached a reduction of 1.45% (314,064/21,642,680)*100=1.45%. The reduction in CO2e achieved during the year was a result of more than 250 investment and operating improvement actions taken throughout Repsol's operations. 253,888 tons of CO2e were reduced in the refineries, 49,006 tons of CO2e in chemical facilities, 9,445 tons of CO2e in E&P assets and 1,725 tCO2e in other areas. Most of the initiatives have been verified according to ISO14064. This achievement is the result of the commitment of the entire organization to improve energy efficiency and GHG emission reductions. The reduction in tCO2e comes from investment actions and operational improvements across all the Company's operations. These actions mainly include improvements in energy efficiency through projects such as energy unit integration, steam consumption optimization, improvements in isolation, furnace modifications, residual heat recovery and technological updating of the equipment, among others.
Divestment			
Acquisitions	17.28	Increase	In May 2015, Repsol acquired the Canadian oil company Talisman Energy Inc. Scope 1 and scope 2 emissions in 2015 took into account 8 months of the Talisman emissions, but 2016 figures take into account the whole year. The difference between taking Talisman's emissions into account for the remaining 4 months is 3,739,470 tCO2e. Our total scope 1 and scope 2 emissions in the previous year were 21,642,680 tCO2e, therefore emissions have increase 17.28%: (3,739,470 /21,642,680)*100=17.28% Currently, Repsol is including Legacy Talisman assets in their Energy Efficiency Management, starting to work in searching emission reduction

Reason	Emissions value (percentage)	Direction of change	Please explain and include calculation
			initiatives and evaluating deeply all the opportunities. Integration of all the assets in Repsol Management process is currently in progress.
Mergers			
Change in output	0.29	Decrease	2016 Scope 1 and Scope 2 emissions have been 25,548,505 tCO2e. If we don't take into account the increased due to Talisman adquisition (3,739,470 tCO2e), neither the increased due to global warming potentials update (542,427 tCO2e) and if we hadn´t carried out the emission reduction activities (that achieve a reduction of 314,064 tons CO2e in 2016), the emissions of our facilities and assets in 2016 would have been 21,580,672 tCO2e (25,548,505 - 3,739,470 - 542,427 + 314,064 = 21,580,672 tCO2e). Our total scope 1 and scope 2 emissions in the previous year were 21,642,680 tCO2e, therefore the variation in the production of the rest of our facilities and assets would have supposed a reduction of 0.29% of our emissions: ((21,580,672 - 21,642,680) /21,642,680) *100=-0.29%.
Change in methodology	2.51	Increase	The global warming potentials used for the conversion to tons of equivalent CO2 have been updated in 2016, based on the information published in the fourth report of the Intergovernmental Panel on Climate Change (IPCC) to align with the most common use reference in the sector. In 2015 figures, global warming potentials were based on the information published in the second report of the IPCC. Using global warming potentials published in the fourth report to recalculate 2015 emissions, they would have increased in 542,427 tCO2e. Our total scope 1 and scope 2 emissions in the previous year were 21,642,680 tCO2e, therefore the global warming potentials change has supposed an increase of 2.51% of our emissions: (542,427 /21,642,680)*100=2.51%.
Change in boundary			
Change in physical operating conditions			
Unidentified			
Other			

CC12.1b

Is your emissions performance calculations in CC12.1 and CC12.1a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Location-based

CC12.2

Please describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tonnes CO2e per unit currency total revenue

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator: Unit total revenue	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
0.000670399	metric tonnes CO2e	38109374978	Location-based	13.2	Increase	Regarding the numerator, during 2016 our total Scope 1 and 2 emissions were 25,548,505 t CO2e, which implies a reduction of 1.3% over the previous year

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator: Unit total revenue	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
						(emissions in 2015 recalculated including Talisman adquisition and global warming potentials update were 25,886,608 t CO2e) With respect to the denominator, Repsol's revenues in term of sales for 2016 was USD 38,109,374,978, 13% less than the previous year's result (USD 43,707,063,143) In case of the oil and gas industry, the intensity figure related with revenues has no sense because this depends on factors not related with the measures carried out by the company to reduce emissions, as the price of crude oil. Despite the fact that Repsol's hydrocarbons production in our Exploration and Production activities in 2016 increased 12% on figures for 2015, and that we have almost the same production of tons of crude oil processed in our refineries, the revenues have been reduced significantly. The intensity figure related with revenues don´t reflect the important effort carried out by our company.

CC12.3

Please provide any additional intensity (normalized) metrics that are appropriate to your business operations

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator	Metric denominator: Unit total	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
0.208	metric tonnes CO2e	Other: Metric tons of crude oil processed in our refineries	43226000	Location-based	0.39	Decrease	Regarding the numerator, during 2016 our Scope 1 and 2 refining emissions were 8,990,597 t CO2e which implies a reduction of 0.6% over the previous year, mainly due to multiple actions carried out to improve energy efficiency (253,888 t CO2e were reduced in 2016 in our refineries thanks to energy saving and fuel switching actions) If these actions had not been carried out, the increase in the refining business CO2 emissions would have been by 2.2% instead of the reduction of 0.6% achieved. With respect to the denominator, during 2016 Repsol's refineries processed almost the same quantity of tons of crude oil than the previous year (43,226,000 metric tons of crude oil in 2016 and 43,334,000 in 2015). Furthermore, it is important to highlight the efforts made by Refining unit in reducing CO2 emissions because our intensity figure have

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator	Metric denominator: Unit total	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
							decreased. To compare 2015 and 2016 data, the intensity figure for 2015 has been recalculated removing emissions of the cracker plants. Those emissions has been published within the Chemical Area because nowadays is the area responsible of the management. In addition, 2015 figure has been recalculated using the global warming potentials updated.
68.82	metric tonnes CO2e	Other: Thousand barrel of oil equivalent produced in our E&P assets	184748	Location-based	13.06	Decrease	Regarding the numerator, during 2016 our upstream emissions were 12,715,234 t CO2e, which implies a reduction of 3% compared to 2015 (2015 Upstream CO2 emissions: 13,113,134 t CO2e, figure recalculated including Talisman adquisition and global warming potentials update). It is important to highlight the efforts made by E&P in reducing CO2 emissions. 9,445 t CO2 were avoided in our E&P assets thanks to energy efficiency and CO2 reduction initiatives carried out. With respect to the denominator, Repsol's hydrocarbons production in 2016 increased 12 % on figures for 2015: 184,748 thousand barrel of oil equivalent produced in 2016 and 165,651 in 2015. In 2016 production data of the joint ventures not operated assets is not included. We have recalculated the 2015 figures to apply this new criterion and to appropiately compare with the 2016 figures. This criterion is more representative than the previous one because E&P emissions reported only consider our operated assets.

Further Information
(Q 12.1): The previous year emissions have been recalculated taking into account the Talisman acquisition (carried out in May 2015) and the update of the global warming potentials. (Q 12.3): The E&P production used in CDP2016 to calculate the intensity figure was the gross production considering operated assets and joint ventures (operated and non-operated). To answer CDP2017 we have adopted a better criterion and we have calculated the intensity figure considering solely the emissions produced by our operated assets and joint ventures operated. We have recalculated all the 2015 intensity figures to apply this new criterion and to easily compare with the 2016 figures . This criterion is more representative than the previous one because E&P emissions reported only consider our operated assets.

Page: CC13. Emissions Trading

CC13.1
Do you participate in any emissions trading schemes?
Yes

CC13.1a
Please complete the following table for each of the emission trading schemes in which you participate

Scheme name	Period for which data is supplied	Allowances allocated	Allowances purchased	Verified emissions in metric tonnes CO2e	Details of ownership
European Union ETS	Fri 01 Jan 2016 - Sat 31 Dec 2016	8846870	5134363	13981233	Facilities we own and operate

CC13.1b

What is your strategy for complying with the schemes in which you participate or anticipate participating?

Our strategy in the area of carbon markets is focused on the following aspects:

1. Manage EU ETS positions of Repsol´s installations as a single integrated position to reduce emission costs and minimize market risk:
Repsol manages deficit positions of all affected business units (in Spain the Refining and Chemicals Business Units and in Portugal the Chemicals Business Units) in the EU ETS. During 2016 Repsol closely followed the EU legislative measure referred to the EU ETS Phase IV definition, anticipating price effects using different market tools such as futures, forwards and other structured operations that have contributed to evaluate and try to reduce the risk of the Group. We participate in IETA (International Emission Trading Association) emerging trading markets working group following the new carbon market developments wherever introduce national trading systems could have implications for Repsol´s upstream or downstream assets.

2. New market-based Mechanism.
The current low prices and demand for carbon credits (CDM/JI projects) don´t promote a global decrease of GHG. For this reason, New market-based Mechanism (NMM) has been proposed to stimulate emission reduction in developing countries beyond existing mechanisms under the Kyoto Protocol. UNFCCC (United Nations Framework Convention on Climate Change) will be responsible for developing rules as well as for the governance of mechanisms. Repsol is supporting those measures, monitoring and participating in industrial associations and think tanks in order to define the modalities and procedures of NMM.

CC13.2

Has your organization originated any project-based carbon credits or purchased any within the reporting period?

Yes

CC13.2a

Please provide details on the project-based carbon credits originated or purchased by your organization in the reporting period

Credit origination or credit purchase	Project type	Project identification	Verified to which standard	Number of credits (metric tonnes CO2e)	Number of credits (metric tonnes CO2e): Risk adjusted volume	Credits canceled	Purpose, e.g. compliance
Credit origination	Energy efficiency: industry	MX4945 (Mexico: Mexico City Transport)	CDM (Clean Development Mechanism)	425	425	No	Compliance
Credit origination	Energy efficiency: industry	Mexico: La Venta II	VER+ (TÜV SÜD standard)	65	65	Yes	Voluntary Offsetting
Credit purchase	Energy efficiency: industry	REDD 844 – Madre de Dios (Peru)	VER+ (TÜV SÜD standard)	3186	3186	Yes	Voluntary Offsetting

Further Information

Page: CC14. Scope 3 Emissions

CC14.1

Please account for your organization's Scope 3 emissions, disclosing and explaining any exclusions

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Purchased goods and services	Relevant, calculated	7570439	This category include emissions associated with the purchased of crude oil and hydrogen used both as a feedstock in our facilities - Repsol's GHG inventories include indirect CO2 emissions resulting from the production of hydrogen. The emissions associated to this category are calculated by multiplying an specific emission factor for H2 by the quantity of this gas purchased and distributed to the various Repsol refineries and chemicals facilities. The emission factor for hydrogen acquisition is 6.9 tCO2/tH2 for Spain, Portugal and Peru. This emission factor is the sum of two components: 1. Reaction component: the raw material used is 100% methane natural gas, with 100% H2 recovery and 100% conversion to CO2 (vapour reforming reaction: $CH_4 + H_2O \rightarrow CO + 3H_2$, displacement reaction of water vapour: $CO + H_2O \rightarrow CO_2 + H_2$), implying process emissions of 5.50 tCO2/tH2. 2. Necessary energy component: The fuel used in the reforming furnaces is natural gas, at a rate of 25,500 MJ/tH2 (a). The natural gas emission factor will be used following the GHG emissions National Inventory in case of Spain and IPPC guidelines for national GHG inventories in case of Portugal and Peru. (a) Average value taken from the BREF of refineries, Integrated Pollution Prevention and Control (IPPC) -reference document on best available techniques for mineral oil and gas refineries, February 2003. -The Repsol GHG inventory includes indirect CO2 emissions resulting from the extraction of crude to be processed in our refineries (Cartagena, La Coruña, Puertollano, Tarragona, Petronor and La Pampilla) and the crude used in Asesa for alphast production. The associated emissions in this category are	0.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			calculated by multiplying an emission factor established by geographical area, the amount of oil that is imported and comes to our refineries. The emission factors used are obtained from the IOGP and are divided according to the following geographic areas: Africa, Asia, Australasia, Europe, FSU, Middle East, North America, South America.		
Capital goods	Not relevant, explanation provided				Repsol considers this category as not relevant since the company has not purchased or acquired a significant amount of capital goods during 2016. Capital goods are no likely to be material source of emissions in any given year for our company.
Fuel-and-energy-related activities (not included in Scope 1 or 2)	Not relevant, explanation provided				To calculate emissions from this category we have considered the emissions associated with the extraction, production (liquefaction and regasification) and transportation of natural gas consumption in our facilities. Different natural gas origins have been considered and bibliographic emission factors that consider each of these sources. Moreover the emissions associated with the extraction, production and transport of fuels used to produce electricity we consume in our facilities have been taken into account by using an emission factor that considers the national energy mix. The result of this estimation contributes to total Scope 3 emissions at a rate less than 1% and Repsol considers that they are not relevant to the company As an integrated oil and gas company, this category is not likely to be material because we consume energy we predominately produce ourselves.
Upstream transportation and distribution	Not relevant, calculated	869483	To calculate emissions from shipping the following values are considered: - Average distance from countries of departure to port of arrival: This information has been provided by Repsol,	0.00%	The result of this calculation contributes to total Scope 3 emissions at a rate less than 1% and Repsol considers that they are not relevant to the company.

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			through Trading and transport department file. The Trading and transport business unit aims to manage and optimize marketing activities, supply and transportation of crude and products of the Group in international markets. - According to the information provided the vessels used to transport upstream products have been between 100,000 < dwt < 170,000 metric tonnes (category according to the deadweight (dwt)). Repsol has chosen a representative deadweight (dwt) which is the average of the ships that carry the corresponding path (from country of departure to port of arrival depending on each refinery). - Fuel consumed by the ships: Repsol has calculated a regression line which links the fuel consumption per day travelled with the previously calculated average deadweight. This line has been drawn from actual consumption data obtained from various websites, the main www.riverlake.ch/tce.php - Furthermore, Repsol has used the average speed of the category ship used for the transport. - With the speed and distances calculated above, Repsol has estimated the travel days and the consumption of fuel by the vessels on the trips. It has been considered the emissions derived from both ways. - The emissions factors used are: - Residual foil oil emissions factor: 77,400.00 kCO2/TJ (IPCC Guidelines 2006) - CH4 emissions factor for maritime transport: 7.00 kgCH4/TJ (IPCC Guidelines 2006) - N2O emission factor: 2.00 kgN2O/TJ (IPCC Guidelines 2006)		During 2016, Repsol Trading Division has developed an initiative to obtain the real consumption of the transport of products whose are processed in the industrial facilities. Repsol has obtained the 81% of the requested data.
Waste generated in operations	Not relevant, calculated	26464	The emissions reported in this category include emissions related to waste treatment and transportation of these from the centers where they are generated to their final destination. The emissions from processing and waste management in industrial centers (refining and chemical) are calculated by multiplying the amount of waste generated that are managed by the emission factors for each type of waste and treatment. We have selected 59 different emission factors from the	0.00%	The result of this calculation contributes to total Scope 3 emissions at a rate less than 1% and Repsol considers that they are not relevant to the company.

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			Ecoinvent v.3 database. The Ecoinvent factors include all the life cycle, from cradle, including all upstream activities, to grave.		
Business travel	Not relevant, calculated	9251	CO2 emissions from Employee business travel and Employee hotel nights are estimated by Carlson Wagonlit Travel, a global leader specializing in business travel management. Carlson Wagonlit Travel, working for and together with its British client UK Defra (Department for Environment, Food and Rural Affairs), has developed an approach to calculating the burden business trips place on the environment. The "CO2 calculator" lets users calculate the carbon emissions from possible transportation alternatives by using specific CO2 emission factors. Repsol has estimated the distance travelled (kilometres) by employees in Spain from the use of the following categories of mobile transport sources: § Rail transport. § Air transport: in this category there are two different types of distance travelled, long haul (>660 km) and medium-short haul. Each category has assigned a default emission factor (g CO2/km) and the CO2 emissions are calculated by the following equation: CO2 Emissions = Distance Travelled x Emission Factor.	0.00%	The result of this calculation contributes to total Scope 3 emissions at a rate less than 1% and Repsol considers that they are not relevant to the company.
Employee commuting	Not relevant, calculated	3645	During 2012 Repsol employees have moved from various offices in Madrid to the Repsol Campus, the new headquarters opened by the company in the Méndez Álvaro area of Madrid. Surveys have been conducted to determine the following information: The number of people who have used each type of transport mode (walking, cycling, bus, taxi, subway, rail, motorcycle, private car, company car and car sharing) and the miles made with this mode of transport and the corresponding percentages in the case of using multiple modes. Emissions of individual workers are calculated by multiplying the number of kilometers travelled by each mode of transport by a specific bibliographic emission factor for each of these modes,	0.00%	This is a methodology conducted by Repsol for calculating these emissions The result of this calculation contributes to total Scope 3 emissions at a rate less than 1% and Repsol considers that they are not relevant to the company.

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			considering the way round. With all this information Repsol has calculated the share of emissions from commuting to the old offices and those due to travel to campus after the move. The number has not change in 2016.		
Upstream leased assets	Not relevant, explanation provided				Repsol has obtained an average emission factor (74 tCO2 / year / service station) considering emissions from 10 company service stations. This is considered as a representative sample for the company since it includes all possible variations in terms of services, shop, washing machines, storage and dispensing, etc. The calculation of emissions in this category has been carried out with this average emission factor and the number of service stations that are leased and operated by Repsol. The result of this calculation contributes to total Scope 3 emissions at a rate less than 1% and Repsol considers that they are not relevant to the company.
Downstream transportation and distribution	Not relevant, calculated	605103	Repsol is able to estimate the CO2 emissions from the external distribution of our activities using the UK Defra guidelines. It is important to stress, however, that several assumptions regarding transport capacities were required due to the complexity of logistics in our industry. In order to calculate External distributions/logistics emissions, Repsol has used the Guideline “Calculating CO2 Emissions from Mobile Sources” available on the GHG Protocol website. The CO2 emissions have been calculated using distance and cargo-based emission factors which are derived from the source: UK's Department for Environment, Food and Rural Affairs (DEFRA). The emission factors are specific to different types of vehicles, and they offer an expanded coverage of freight transport. The freight transport emission factors require activity data on tonne-kilometres travelled by the different types of freight vehicles used in Repsol operations, which	0.00%	This is a methodology conducted by Repsol for calculating these emissions The result of this calculation contributes to total Scope 3 emissions at a rate less than 1% and Repsol considers that they are not relevant to the company.

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			included road and rail vehicles. Calculating emissions requires two main steps: Collect data on distance travelled by vehicle type. We have considered two types of vehicles: road transport (heavy goods vehicle) and rail transport. Depending on its weight, it will be used in step 2 a specific emission factor provided by UK DEFRA. Convert tonne-kilometres to CO2 emissions by multiplying results from step 1 by distance and cargo-based emissions factors. CO2 Emissions = Distance travelled·Cargo x Emission Factor.		
Processing of sold products	Not relevant, explanation provided				Repsol has calculated emissions that take place in our customer's facilities for the use of chemicals which represent the greater number of sales for Repsol. For calculations Repsol has considered the criteria of the PAS 2050 standard and used an emission factor provided by one of our most important customers. The result of this calculation contributes to total Scope 3 emissions at a rate less than 1% and Repsol considers that they are not relevant to the company
Use of sold products	Relevant, calculated	146387076	We have used the methodology published by CDP for calculating category 11 in the O&G sector. The methodology used for the calculation is based on production. We take into account the upstream and downstream production. Additionally, Upstream production has been corrected subtracting the refined oil in our refineries. We used the "High tier", specifically equation number 21 (page 19 of the CDP guide) which takes into account the quantity produced, the emission factor and EO effective oxidation rate. The emission factors used are based on The Institute's Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry of API (American Petroleum Institute).	0.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
End of life treatment of sold products	Not relevant, explanation provided				Repsol has calculated emissions from landfill and recycling of chemicals which represent the greater number of sales for Repsol. To be conservative, it was considered that only 50% of these products have been recycled while the rest has been taken to landfill. The company has conducted several case studies, considering different recycling processes and percentages for them. The result of this calculation contributes to total Scope 3 emissions at a rate less than 1% and Repsol considers that they are not relevant to the company.
Downstream leased assets	Not relevant, explanation provided				Repsol has obtained an average emission factor (74 tCO2 / year / service station) considering emissions from 10 company service stations. This is considered as a representative sample for the company since it includes all possible variations in terms of services, shop, washing machines, storage and dispensing, etc. The calculation of emissions in this category has been carried out with this average emission factor and the number of service stations that are owned by Repsol and leased to other entities The result of this calculation contributes to total Scope 3 emissions at a rate less than 1% and Repsol considers that they are not relevant to the company.
Franchises	Not relevant, explanation provided				Repsol has obtained an average emission factor (74 tCO2 / year / service station) considering emissions from 10 company service stations. This is considered as a representative sample for the company since it includes all possible variations in terms of services, shop, washing machines, storage and dispensing, etc. The calculation of emissions in this category has been carried out with this average

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
					emission factor and the number of service stations that are franchises. The result of this calculation contributes to total Scope 3 emissions at a rate less than 1% and Repsol considers that they are not relevant to the company.
Investments	Not relevant, explanation provided				Repsol reports its emissions on operation control and equity share criteria, so we already take into account these emissions in our scope 1 and 2. Additionally, Repsol considers this category as not relevant since the company has not made significant investments that can be taken into account in this category in 2016.
Other (upstream)					
Other (downstream)					

CC14.2

Please indicate the verification/assurance status that applies to your reported Scope 3 emissions

Third party verification or assurance process in place

CC14.2a

Please provide further details of the verification/assurance undertaken, and attach the relevant statements

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 3 emissions verified (%)
Annual process	Complete	Limited assurance	Verification letter and 2016 Sustainability report-detailed indicators.zip	The document attached is a zip file that contains: - First folder: "2016 Sustainability Report –Detailed indicators": Page 22-23: G4-EN17 Other indirect greenhouse gas emissions. - Second folder: "Verification letter 2016 Sustainability report": Page 1-2: Verification letter.	ISAE3000	99
Annual process	Complete	Moderate assurance	Verification letter and 2016 Sustainability	The document attached is a zip file that contains: - First folder: "2016 Sustainability Report –Detailed indicators": Page 22-23: G4-EN17 Other indirect greenhouse gas emissions. - Second	AA1000AS	99

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 3 emissions verified (%)
			report-detailed indicators.zip	folder: “Verification letter 2016 Sustainability report”: Page 1-2: Verification letter.		

CC14.3

Are you able to compare your Scope 3 emissions for the reporting year with those for the previous year for any sources?

Yes

CC14.3a

Please identify the reasons for any change in your Scope 3 emissions and for each of them specify how your emissions compare to the previous year

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
Purchased goods & services	Change in output	11	Decrease	Emissions associated with the purchase of goods and services in 2016 were reduced, essentially as a result of the varied origin of purchased crude, since there was an increase in the crude purchased from areas with lower emission factors. We obtain these factors from the annual report published by IOGP. At Repsol, some projects are being developed with the objective of reducing the emissions in the purchase of goods and services. It’s been done an important research work to convert CO2 into polymer materials, thereby replacing fossil-origin raw materials . An example is the eco-designed Polycarbonate Polyol which includes CO2 in its composition, so the carbon footprint of this Polycarbonate Polyol is lower than a conventional one. Other project that is being developed in the company is about waste plastic recycling into useful raw material for the petrochemical business. Other initiative is the research into new and more efficient epoxidation technologies for our plant producing Propylene Oxide and Monomer Styrene (PO/MS, a facility using Repsol’s own in-house technology). This will bring about a more efficient process in terms of both consumption of raw materials and also in terms of energy. The plan is to extend eco-designed products portfolio and systematize this methodology in the development of new products.
Upstream transportation & distribution	Change in output	12	Decrease	The Upstream transportation and distribution emissions have fallen due to the decrease of the total amount of products transported and also the kilometers covered in 2016.
Waste generated in operations	Emissions reduction activities	28	Decrease	At Repsol, we are working to improve waste management throughout the life cycle of our processes in order to minimize our impact on the environment. The waste produced at the company may come from productive activities, maintenance operations, special operations, may be the derived from soil remediation, drilling operations, or those produced during facility construction or dismantling. We classify hazardous and non-hazardous waste in function of characteristic criteria such as toxicity and inflammability. To minimize their production, we pay strict attention to the manner in which we handle the waste that originates from each of the phases of our work, adopting measures meant to improve internal management. To do this, we prioritize minimizing the production of waste and reduce its disposal at dumps through reuse and recycling according to the hierarchy established in the best practices for waste. In line with the publication of the circular economy measures package published by the European Commission on December 2, 2015, at Repsol we are carrying out

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
				actions to reduce inefficiencies in processes by minimizing waste production and supporting projects where waste remains in the productive process longer, thereby reducing external elimination and encouraging the closure of the circular economy's loop. With this, we will be able to ensure that valid materials are reintroduced into the economic cycle. Repsol's commitment is reflected in the target to reduce waste by 50 kilotons, which is established for the 2015-2020 period. Thanks to our efforts made in the business areas, the established annual target has been surpassed, being able to reach a reduction of 15.5 kilotons in 2016. Combined with the 9 kilotons reduction in 2015, meaning that the company has managed to attain nearly 50% its total reduction target for the period in only two years. In addition to this quantitative objective, we have defined qualitative actions to improve waste management. We have established improvement goals in our E&P business through the implementation of the company's Environmental Performance Practices (EPP) to manage drilling cuttings and muds. These directives constitute a collection of common standards regardless of the geographical area in which they are applied and the specific legislations of each country. In 2016, 100% of the EPPs planned were implemented.
Business travel	Emissions reduction activities	33	Decrease	The company continues working in promoting the use of new technologies to communicate between our centers in order to avoid journeys. In addition, we continue to promote the corporate car-sharing program with electric vehicles, an innovative form of mobility that allows for reducing the use of private vehicles. . In 2016, the 443 users registered in the service have traveled more than 33,165 kilometres with no contaminant emissions. The emissions generated by our business travels have fallen a 49% due to the decrease of the frequency that the employees travel abroad. The company has encouraged employees to hold teleconferencing meetings instead of face to face meetings.
Employee commuting	Other: No relevant change in the conditions	0	No change	We made an estimation of this category in 2012 that it is not relevant for our company, as the data has not change we consider the same emissions.
Downstream transportation and distribution	Change in output	42	Decrease	The Company is working in reduce the emissions generated due to the transport of products and raw materials used in Downstream area. This is achieved by identifying opportunities and promoting projects, as for example the "Program of activities to encourage a shift from road transport to rail transport at Repsol". This program was selected in 2016 as CLIMA Project by the Ministry of Agriculture, Food and the Environment. The aim of this project is to group together initiatives relating to product logistics that aim to replace road transport with rail transport. This project was able to reduce CO2 emissions by 66 tons in 2016. The emissions derived from the downstream transportation and distribution has fallen considerably because the emission factors used were lower due to the use of increasingly energy efficient vehicles.
Use of sold products	Change in output	4	Increase	Emissions arising from the sale of products in 2016 rose, due to higher production of our Exploration and Production assets (production increase in 2016 compared to the previous year is due to the incorporation of Talisman assets from January onwards, while the data for 2015 include Talisman from the date of purchase in the month of May). The Company has been working in reducing the emissions generated when our products are used. We do this by identifying opportunities, promoting projects and implementing business initiatives. In 2016, we have continued to promote electric mobility through IBIL, where we provide an integral recharging

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
				service based on 100% renewable energy. We currently have 859 operational recharging points. Our total investment in this project to date is USD 8 Million. Repsol's Electric Car Project has been selected as a CLIMA project. This project reduced CO2 by 330 tons in 2016, which were verified by an accredited entity. Other initiatives carried out is the use of autogas (automotive LPG), we have 745 AutoGas supply points, and are gradually extending our network. This alternative energy reduces CO2 emissions by around 15% against gasoline. In addition, advance lubricant formulas have been carried out. Prospection studies of energy for transport enable us to anticipate technological changes. This allows us to define R&D projects and analyze the competitiveness of new propulsion systems in conjunction with different energy sources. On the other hand, Repsol commercializes Neotech fuels, which incorporate an innovative formula that improves engine performance and its impact on the environment, reducing consumption and lengthen the average life of the engine. Additionally, BiEnergy e+10 is a cutting-edge diesel developed by the Repsol Technology Center. Its use in combination with condensing boilers and blue flame burners allows CO2 emissions to be reduced, with savings of up to 30% compared to conventional boilers. Moreover, Repsol helps to reduce CO2 emissions through the use of biofuels, including bioethanol in gasolines and biodiesel and Vegetable Oil in gasoil. The company's Technology Center has advanced biofuel projects in the development phase. CO2 emissions are also avoided through warm recycled asphalts, which need a smaller working temperature, and allows a reduction in the raw materials needed up to 90%.

CC14.4

Do you engage with any of the elements of your value chain on GHG emissions and climate change strategies? (Tick all that apply)

Yes, our suppliers
Yes, our customers
Yes, other partners in the value chain

CC14.4a

Please give details of methods of engagement, your strategy for prioritizing engagements and measures of success

- Suppliers:
The company has been implementing EnMS in their facilities and certifying them under ISO50001 since 2011. This allows Repsol to achieve a more efficient energy and carbon management along the entire supply chain. These systems encourage a management approach through the use of more efficient products and services. Consequently, Repsol engages with their suppliers through energy performance requirements in the purchase offers which evaluates. The evaluated bids are focused on two areas; third party workers and purchases of products or equipment. Repsol communicate the selected suppliers that energy efficiency criteria are going to take into account in the evaluation of all the bids presented.
To prioritize engagement Repsol always studies different supplier offers which are expected to have a significant GHG emission impact. In each offer it's analyzed the potential energy performance improvement over the planned or expected operating lifetime. Those cost-effective options with greater improvement are hired and recorded within the EnMS. This record will be used to prove that the requirements of the standard are followed, and to obtain or renew the certification in the facility.
Measurement of success and positive outcomes achieved: The success is achieved when the energy reduction targets and actions fixed in the EnMS are obtained. In 2016, the Sines Chemical Facility was certified following the ISO50001 standard, joining the ranks of eight facilities and one multisite business that are currently certified.

- Customers:
Repsol promotes initiatives to reduce the carbon intensity through the life cycle of our products. Our company identifies opportunities, promotes projects and implements business initiatives through collaborative projects in areas such as renewable energy for transport or the development of more environmentally friendly products.

To prioritize engagement Repsol evaluates the economical, technical and environmental performance of possible opportunities that have synergies with our current business lines. The opportunities that have higher performance are prioritized.
Measurement of success is carried out in several ways. For example, low carbon collaborative projects that meet the specifications established by the Spanish Ministry of Agriculture, Food and the Environment are managed and verified as “Clima Projects” and seek to promote GHG emissions reductions in the diffuse sector. During 2016, two projects presented by Repsol were selected: the “e-mobility activity program” and the “Program of activities to encourage a shift from road transport to rail transport at Repsol”. In addition during 2016 Repsol was involved in different projects with its customers to reduce the carbon footprint from its activity: The company has taken part in the reforestation of the Mallorcan Sa Duaia promoted by Meliá Hotels International and started a pilot project to reduce emissions of the sector transport by installing a telemetric instrument in one of its customer fleet.

- Other partners:
Repsol also seeks to engage investors and the civil society at large. In 2016 we held the third “Repsol Sustainability Day”, an event for analysts and investors, where the key projects were explained. Investors are also engaged through General Shareholders´s Meeting. On the other hand, we seek to engage the society through the Campus Open House Days and also the Road Racing World Championship Grand Prix. In our program of Corporate Volunteering, our employees reforest degraded areas or carried out energy efficiency working days at schools. We also engage universities through the The Inspîre Program, created as an initiative to make the best energy ideas into a reality. In addition, Repsol promotes the Entrepreneurs Fund of the Fundacion Repsol. The Fund is aimed at entrepreneurs with innovative technological projects in the field of energy who have set up or intend to set up a company. Finally, Repsol seeks to give solutions to energy concerns of the society through the Smart Energy website, in which we explain different environmental topics, giving some tips for being more sustainable.
To prioritize engagement Repsol analyzes the portfolio of socially responsible investors and seeks to increase it proving the effort carried out to reduce GHG emissions. For The Inspire program and the Entrepreneurs Fund, Repsol launches different energy challenges and selects the best proposals.
A measurement of success is the increase of the percentage of socially responsible investors in our portfolio, which has increased to a 12% in 2016. Another measurement of success is the number of visits of our Smart Energy website, which have also increased in 2016. The measurement of success of The Inspire program and the Entrepreneurs Fund is the number of ideas received every year.

CC14.4b

To give a sense of scale of this engagement, please give the number of suppliers with whom you are engaging and the proportion of your total spend that they represent

Type of engagement	Number of suppliers	% of total spend (direct and indirect)	Impact of engagement
Active engagement	5000	48%	Our supply chain management system evaluates suppliers to identify, among others, environmental risks. During supplier evaluation process suppliers must meet various qualification requirements among which are several related to climate change (emissions management and energy efficiency management). Consequently during the negotiation Repsol adds a special sustainability clause in the General Conditions for Purchasing and Contracting. In addition the suppliers of our refineries, chemical facilities and others assets certified with the international standard ISO50001 needs to meet a requirement of energy efficiency in all the equipment and services contracted. Because of that we have developed a procedure that establishes the energy efficiency requirements for the purchase of equipment and service contracts. The 48% is the result of dividing the expenditure of those areas which have engagement with their suppliers by the total expenditure of the company. The areas included in the calculation are: Refining and chemical Division, the E&P Ecuador asset, Spain IT Division, Spain and Portugal Engineering Division, Spain and Portugal commercial Ddivision and Spain and Portugal lubricants Division.

Further Information

(Q14.1) Even though Repsol uses own data for calculations and final estimates, these data have been multiplied by emission factors and bibliographic data, therefore the percentage of emissions calculated using primary data is considered zero. Repsol criterion to determine the relevance: Categories whose emissions contribute to total Scope 3 of the company in less than 1% are not considered relevant. (Q14.1 & Q14.3a) Repsol's campus, the new headquarters opened by the company in 2012, is the only business park located in the centre of Madrid and is one of the city's most sustainable and modern buildings. As part of the Repsol Mobility and Road Safety Plan, the company expects various benefits, including reducing the carbon footprint of the company through various measures, among which include: TeleMeeting, flexible scheduling and promoting teleworking: regarding collaboration tools, most meeting rooms are equipped with videoconferencing equipment whose use is widespread in Repsol, and employees has the Microsoft Lync collaboration tools that allow instant messaging, audio and video conferencing for sharing information. Promoting sustainable and efficient mobility when traveling: Campus location allows quick access to public transport. Furthermore, Repsol provides to employees corporate car sharing service with electric vehicles and advantageous conditions for electric vehicle charging. Sustainability criteria along the entire life cycle of the building: Campus promotes energy efficiency and uses renewable energy and, improved indoor and outdoor insulation. (Q14.3a) Purchased good and services: The scope in previous years has been broadened, including the emission associated with this category at the La Pampilla refinery. The 2015 data were recalculated on this basis. In addition, emissions for 2015 have been also recalculated taking into account the emission factor for hydrogen acquisition update (6.90 tCO2/tH2). Downstream Transportation and distribution: These emissions were calculated using the factors supplied by DEFRA for goods road haulage. These factors are calculated on the basis that a truck completes part of the total journey empty, and therefore for the purposes of calculating emissions it is not necessary to double the distance over which goods are transported to account for the portion of the journey during which the truck was empty. In the specific case of rail transport, we have only considered the journey of diesel locomotives, which account for 40% of them, with the remaining 60% of electric locomotives outside the perimeters, according to the study published by the Railway Observatory in Spain. The 2015 emissions were calculated in due consideration of this. Use of sold products: To calculate the difference between 2015 and 2016 in the “Use sold products” scope 3 category; the 2015 emissions have been recalculated because there was an error. (Q14.4b): Repsol has engagement with more than 13,000 suppliers.

Module: Sign Off

Page: CC15. Sign Off

CC15.1

Please provide the following information for the person that has signed off (approved) your CDP climate change response

Name	Job title	Corresponding job category
Antonio Lorenzo Sierra	Corporate Director of Strategy, Control and Resources	Board/Executive board

Further Information

Module: Oil & Gas

Page: OG0. Reference information

OG0.1

Please identify the significant petroleum industry components of your business within your reporting boundary (select all that apply)

Exploration, production & gas processing
Storage, transportation & distribution
Specialty operations
Refining
Retail & marketing

Further Information

Page: OG1. Production, reserves and sales by hydrocarbon type - (1 Jan 2016 - 31 Dec 2016)

OG1.1

Is your organization involved with oil & gas production or reserves?
Yes

OG1.2
Please provide values for annual gross and net production by hydrocarbon type (in units of BOE) for the reporting year in the following table. The values required are aggregate values for the reporting organization

Product	Gross production (BOE)	Net production (BOE)	Production consolidation boundary	Comment

OG1.3
Please provide values for reserves by hydrocarbon type (in units of BOE) for the reporting year. Please indicate if the figures are for reserves that are proved, probable or both proved and probable. The values required are aggregate values for the reporting organization

Product	Country/region	Reserves (BOE)	Date of assessment	Proved/Probable/Proved+Probable

OG1.4
Please explain which listing requirements or other methodologies you have used to provide reserves data in OG1.3. If your organization cannot provide data due to legal restrictions on reporting reserves figures in certain countries, please explain this

OG1.5
Please provide values for annual sales of hydrocarbon types (in units of BOE) for the reporting year in the following table. The values required are aggregate values for the reporting organization

Product	Sales (BOE)	Comment

OG1.6
Please provide the average breakeven cost of current production used in estimation of proven reserves

Hydrocarbon/project	Breakeven cost/BOE	Comment

OG1.7
In your economic assessment of hydrocarbon reserves, resources or assets, do you conduct scenario analysis and/or portfolio stress testing consistent with a low-carbon energy transition?
Yes, other

OG1.7a
Please describe your scenario analysis and/or portfolio stress testing, the inputs used and the implications for your capital expenditure plans and investment decisions
Repsol, like most oil and gas companies use various tools to manage the risk that greenhouse gas policies create for their business.
Decisions on making new investments in exploration and development of reserves will continue to be based on expected risk weighted returns. Costs, prices, and many other relevant strategic elements (i.e. subsurface uncertainties, access to infrastructure and markets, policy, etc.) are taken into consideration. The issue of climate change and possible climate policy regulations are incorporated into such decisions.
Repsol has defined an internal carbon price to ensure the resilience of its portfolio, encouraging energy efficiency and low emissions technologies.

Further Information
The information required in questions OG1.2 and OG1.3 is reported on our 2016 Consolidated Management Report (see document attached 5.1.2 Upstream Activities-Pages No.32-34). OG1.2: The 2016 total net production of liquids and natural gas was 253 MMboe, 89 MMb of liquids and 164 MMbeo of natural gas. The breakdown by region is the following: - Liquids: 16 MMb in Europe, 39 MMb in Latin America, 20 MMb in North America, 3 MMb in Africa and 11 MMb in Asia. - Natural gas: 17 bcf in Europe, 486 bcf in Latin

America, 262 bcf in North America, 16 bcf in Africa and 137 bcf in Asia. OG1.3: At year-end 2016, Repsol's proven reserves, estimated in accordance with the US Securities and Exchange Commission (SEC)'s conceptual framework for the oil and gas industry, and in accordance with the criteria envisaged under the Petroleum Reserves Management System of the Society of Petroleum Engineers (PRMS-SPE), amounted to 2,382 Million barrels of crude oil equivalent, of which 584 MMboe (25%) consisted of crude oil, condensates and liquefied gases, and the remaining 1,798 MMboe (75%) natural gas. The breakdown by region is the following: - 62 MMbeo in Europe, 1.525 MMbeo in Latin America, 496 MMbeo in North America, 125 MMbeo in Africa and 174 MMbeo in Asia. In 2016, the development of these reserves was positive, with the addition of a total of 261 MMboe, mainly from extensions and discoveries in Peru, the United States and Canada, revisions of previous estimates in Trinidad and Tobago, Peru and Venezuela, and the improved recovery in Brazil. In 2016 the Company achieved a reserve replacement ratio (calculated by dividing total additions of proven reserves in the period by production for the period) of 103% (509% in 2015 and 118% in 2014) for crude oil, condensates, LPG and natural gas (96% in crude oil, condensates and LPG, and 107% in natural gas), which is in line with the Company's long-term objectives, incorporating resources that significantly strengthen future growth. The organic reserve replacement ratio (not including purchases and sales) reached 124% for crude oil, condensates, LPG and natural gas combined (118% in crude oil, condensates and LPG, and 127% in natural gas)

Attachments

Consolidated Management Report 2016_Pages No 32_34.pdf

Page: OG2. Emissions by segment in the O&G value chain - (1 Jan 2016 - 31 Dec 2016)

OG2.1

Please indicate the consolidation basis (financial control, operational control, equity share) used to report the Scope 1 and Scope 2 emissions by segment in the O&G value chain. Further information can be provided in the text box in OG2.2

Segment	Consolidation basis for reporting Scope 1 emissions	Consolidation basis for reporting Scope 2 emissions
Exploration, production & gas processing	Operational Control	Operational Control
Storage, transportation & distribution	Operational Control	Operational Control
Specialty operations	Operational Control	Operational Control
Refining	Operational Control	Operational Control
Retail & marketing	Operational Control	Operational Control

OG2.2

Please provide clarification for cases in which different consolidation bases have been used and the level/focus of disclosure. For example, a reporting organization whose business is solely in storage, transportation and distribution (STD) may use the text box to explain why only the STD row has been completed

OG2.3

Please provide masses of gross Scope 1 carbon dioxide and methane emissions in units of metric tonnes CO2 and CH4, respectively, for the organization's owned/controlled operations broken down by value chain segment

Segment	Gross Scope 1 carbon dioxide emissions (metric tonnes CO2)	Gross Scope 1 methane emissions (metric tonnes CH4)
Exploration, production & gas processing	7672005	195502
Storage, transportation & distribution	11131	0
Specialty operations	3435868	635
Refining	8562129	2409
Retail & marketing	2073	0

OG2.4

Please provide masses of gross Scope 2 GHG emissions in units of metric tonnes CO2e for the organization's owned/controlled operations broken down by value chain segment

Segment	Gross Scope 2 emissions (metric tonnes CO2e)	Comment
Exploration, production & gas processing	125404	Scope 2 emissions reported are location based
Storage, transportation & distribution	14219	Scope 2 emissions reported are location based
Specialty operations	268080	Scope 2 emissions reported are location based
Refining	217365	Scope 2 emissions reported are location based
Retail & marketing	38676	Scope 2 emissions reported are location based

Further Information

Page: OG3. Scope 1 emissions by emissions category - (1 Jan 2016 - 31 Dec 2016)

OG3.1

Please confirm the consolidation basis (financial control, operational control, equity share) used to report Scope 1 emissions by emissions category

Segment	Consolidation basis for reporting Scope 1 emissions by emissions category
Exploration, production & gas processing	Operational Control
Storage, transportation & distribution	Operational Control
Specialty operations	Operational Control
Refining	Operational Control
Retail & marketing	Operational Control

OG3.2

Please provide clarification for cases in which different consolidation bases have been used to report by emissions categories (combustion, flaring, process emissions, vented emissions, fugitive emissions) in the various segments

OG3.3

Please provide masses of gross Scope 1 carbon dioxide and methane emissions released into the atmosphere in units of metric tonnes CO2 and CH4, respectively, for the whole organization broken down by emissions category

Emissions category	Gross Scope 1 carbon dioxide emissions (metric tonnes CO2)	Gross Scope 1 methane emissions (metric tonnes CH4)
Combustion		
Flaring		
Process emissions		
Vented emissions		
Fugitive emissions		

OG3.4

Please describe your organization's efforts to reduce flaring, including any flaring reduction targets set and/or its involvement in voluntary flaring reduction programs, if flaring is relevant to your operations

In 2016 Repsol flared an amount of gas equivalent to 1.18 million tons of CO2 which accounts for 5% of total Repsol emissions.
Repsol continuously support flaring reduction initiatives in their production sites. These initiatives are part of the energy efficiency and CO2 emissions reduction plans. Flaring reduction initiatives have also an economical profit potential associated to the gas sales or to the possible use of the gas as internal fuel.

Repsol's Environmental Performance Practices (EPPs) establish that upstream new installations shall not be designed to continuously vent or flare gases under normal operating conditions. And, for existing installations, an Action Plan shall be established to minimize continuous and non-continuous production venting and flaring of associated gas. Specific energy analysis towards the identification of flaring reduction potential has been included in the upstream operational review-energy methodology. Important efforts are being done in monitoring and characterization of the flared gas to create awareness about the wasted energy and promote efficient operation.

Regarding downstream facilities flaring reduction objectives are part of the refineries energy objectives. A "zero-flaring" strategy has been implemented in normal plant operation. Since design phases reuse or recovery of gas streams is considered before sending them to flare. All the Spanish refineries have one or more flare gas recovery compressors to reuse the gas as fuel in their processes. E.g.In 2016 we identified operational improvements that significantly reduced flared gas emissions. One such measure was at the Petronor refinery (Muskiz, Vizcaya), where we identified and minimized discharge points and optimized operation of liquid ring compressors in order to recover the largest possible amount of gas to be reused at the refinery instead of burning it on flare. These measures enabled us to reduce CO2 emissions by 15,000 tons/year at the refinery
Repsol as signatory company of the OGCI Joint collaborative declaration has made a public commitment to eliminate routine flaring from its operations.
On June 10th 2016, Repsol endorsed the Zero Routine Flaring by 2030 World Bank Initiative. This endorsement is fully aligned with Repsol policies and commitment as part of the OGCI.

Further Information
The Organization doesn´t have the information required in the question OG3.3 broken down by all the emissions categories specified. Nevertheless, Repsol is developing a plan to manage methane emissions which takes into account the procedures and actions already developed to implement new initiatives (e.g. Leak Detection and Repair –LDAR- programs) in order to achieve further methane emissions reductions in all of our operations. On the other hand, Repsol as signatory company of the OGCI Joint collaborative declaration has made a public commitment to collaborate with the other signatory companies in different areas, including natural gas developments, reducing methane emissions from our operations. On June 10th 2016 Repsol has signed the Memorandum of the Understanding of the Climate and Clean Air Coalition Oil & Gas Methane Partnership initiative (CCAC-OGMP), to implement methane emission reduction projects in collaboration with other companies, institutions and governments. We seek to eliminate barriers and come up with technical and economically viable solutions. This endorsement is fully aligned with Repsol policies and commitment as part of the OGCI.

Page: OG4. Transfers & sequestration of CO2 emissions - (1 Jan 2016 - 31 Dec 2016)

OG4.1
Is your organization involved in the transfer or sequestration of CO2?
Yes

OG4.2
Please indicate the consolidation basis (financial control, operational control, equity share) used to report transfers and sequestration of CO2 emissions

Activity	Consolidation basis
Transfers	Operational Control
Sequestration of CO2 emissions	

OG4.3
Please provide clarification for cases in which different consolidation bases have been used (e.g. for a given activity, capture, injection or storage pathway)
OG4.4
Using the units of metric tonnes of CO2, please provide gross masses of CO2 transferred in and out of the reporting organization (as defined by the consolidation basis). Please note that questions of ownership of the CO2 are addressed in OG4.6

Transfer direction	CO2 transferred – Reporting year
CO2 transferred in	

Transfer direction	CO2 transferred – Reporting year
CO2 transferred out	

OG4.5

Please provide clarification on whether any oil reservoirs and/or sequestration system (geological or oceanic) have been included within the organizational boundary of the reporting organization. Provide details, including degrees to which reservoirs are shared with other entities

OG4.6

Please explain who (e.g. the reporting organization) owns the transferred emissions and what potential liabilities are attached. In the case of sequestered emissions, please clarify whether the reporting organization or one or more third parties owns the sequestered emissions and who has potential liability for them

Part of the CO2 emissions generated at Petronor Refinery are transferred to an external enterprise that use it as a raw material. The CO2 flow transferred is registered with ultrasonic flow meters located in the refinery to calculate the amount sold.

OG4.7

Please provide masses in metric tonnes of gross CO2 captured for purposes of carbon capture and sequestration (CCS) during the reporting year according to capture pathway. For each pathway, please provide a breakdown of the percentage of the gross captured CO2 that was transferred into the reporting organization and the percentage that was transferred out of the organization (to be stored)

Capture pathway in CCS	Captured CO2 (metric tonnes CO2)	Percentage transferred in	Percentage transferred out

OG4.8

Please provide masses in metric tonnes of gross CO2 injected and stored for purposes of CCS during the reporting year according to injection and storage pathway

Injection and storage pathway	Injected CO2 (metric tonnes CO2)	Percentage of injected CO2 intended for long-term (>100 year) storage	Year in which injection began	Cumulative CO2 injected and stored (metric tonnes CO2)

OG4.9

Please provide details of risk management performed by the reporting organization and/or third party in relation to its CCS activities. This should cover pre-operational evaluation of the storage (e.g. site characterization), operational monitoring, closure monitoring, remediation for CO2 leakage, and results of third party verification

Further Information

Carbon capture, use and storage (CCUS): This technology will be critical to achieve the objectives of the Paris Agreement, since it is the only one capable of substantially reducing GHG emissions from fossil fuels. These fuels will continue to play a significant role in the future energy mix and CCUS will reduce emissions in sectors such as electric power generation or energy-intensive industries. This is one of the lines of work in which we are taking part in OGCI.

Page: OG5. Emissions intensity - (1 Jan 2016 - 31 Dec 2016)

OG5.1

Please provide estimated emissions intensities (Scope 1 + Scope 2) associated with current production and operations

Year ending	Segment	Hydrocarbon/product	Emissions intensity (metric tonnes CO2e per thousand BOE)	% change from previous year	Direction of change from previous year	Reason for change
2016	Exploration, production & gas processing		68.82	13.06	Decrease	Regarding the numerator, during 2016 our upstream emissions were 12,715,234 t CO2e, which implies a reduction of 3% compared to 2015 (2015 Upstream CO2 emissions: 13,113,134 t CO2e, figure recalculated including Talisman adquisition and global warming potentials update). It is important to

Year ending	Segment	Hydrocarbon/product	Emissions intensity (metric tonnes CO2e per thousand BOE)	% change from previous year	Direction of change from previous year	Reason for change
						highlight the efforts made by E&P in reducing CO2 emissions. 9,445 t CO2 were avoided in our E&P assets thanks to energy efficiency and CO2 reduction initiatives carried out. With respect to the denominator, Repsol's hydrocarbons production in 2016 increased 12 % on figures for 2015: 184,748 thousand barrel of oil equivalent produced in 2016 and 165,651 in 2015. In 2016 production data of the joint ventures not operated assets is not included. We have recalculated the 2015 figures to apply this new criterion and to appropiately compare with the 2016 figures. This criterion is more representative than the previous one because E&P emissions reported only consider our operated assets.
2016	Refining		29.12	0.39	Decrease	Regarding the numerator, during 2016 our Scope 1 and 2 refining emissions were 8,990,597 t CO2e which implies a reduction of 0.6% over the previous year, mainly due to multiple actions carried out to improve energy efficiency (253,888 t CO2e were reduced in 2016 in our refineries thanks to energy saving and fuel switching actions) If these actions had not been carried out, the increase in the refining business CO2 emissions would have been by 2.2% instead of the reduction of 0.6% achieved. With respect to the denominator, during 2016 Repsol's refineries processed almost the same quantity of tons of crude oil than the previous year (43,226,000 metric tons of crude oil in 2016 and 43,334,000 in 2015). Furthermore, it is important to highlight the efforts made by Refining unit in reducing CO2 emissions because our intensity figure have decreased. To compare 2015 and 2016 data the intensity figure for 2015 has been recalculated removing emissions of the cracker plants. Those emissions has been published within the Chemical Area because nowadays is the area responsible of the management. In addition, 2015 figure has been recalculated using the global warming potentials updated.

OG5.2

Please clarify how each of the emissions intensities has been derived and supply information on the methodology used where this differs from information already given in answer to the methodology questions in the main information request

In case of the oil and gas industry, it is important to establish a clear distinction between the way the Downstream and Upstream Divisions report their CO2 emissions, considering the diversity of the operations. Repsol has been working in the development of measuring indicators that best reflect its diverse activities.

The emissions intensity for refining operations includes Refining Scope 1 and 2 GHG emissions per thousand barrels of oil equivalent (BOE), based on operational control criteria.

In Exploration and Production activity, the emissions intensity includes Exploration and Production Scope 1 and 2 GHG emissions per thousand barrels of oil equivalent (BOE) produced, based on operational control criteria.

Further Information

Page: OG6. Development strategy - (1 Jan 2016 - 31 Dec 2016)

OG6.1
For each relevant strategic development area, please provide financial information for the reporting year

Strategic development area	Describe how this relates to your business strategy	Sales generated	EBITDA	Net assets	CAPEX	OPEX	Comment
Renewable energy, excluding Biomass and Biofuels		35532945	23575984	236781720	60902160	15957762	
Energy efficiency		5075180	441320	5295840	1985940	4633860	
Other: Electric vehicle		825949	1035112	2273907	531185	1609733	
Biofuels		0	33926	0	0	33926	

OG6.2
Please describe your future capital expenditure plans for different strategic development areas

Strategic development area	CAPEX	Total return expected from CAPEX investments	Comment

OG6.3
Please describe your current expenses in research and development (R&D) and future R&D expenditure plans for different strategic development areas

Strategic development area	R&D expenses – Reporting year	R&D expenses – Future plans	Comment
Exploration and development of new hydrocarbon reserves	15174134		
Renewable energy, excluding Biomass and Biofuels	62850		
Biofuels	1774343		
Energy efficiency	10211886		
Methane management	5880		
Other: Electric vehicle	298279		
Biomass, excluding Biofuels	129976		
Other: Technologycal analysis	422939		

Further Information

Page: OG7. Methane from the natural gas value chain

OG7.1
Please indicate the consolidation basis (financial control, operational control, equity share) used to prepare data to answer the questions in OG7

Segment	Consolidation basis
Exploration, production & gas processing	Operational Control
Storage, transportation & distribution	Operational Control

Segment	Consolidation basis
Specialty operations	Operational Control
Refining	Operational Control
Retail & marketing	Operational Control

OG7.2

Please provide clarification for cases in which different consolidation bases have been used

There are no cases in which different consolidation bases have been used

OG7.3

Does your organization conduct leak detection and repair (LDAR), or use other methods to find and fix fugitive methane emissions?

Yes

OG7.3a

Please describe the protocol through which methane leak detection and repair, or other leak detection methods, are conducted, including predominant frequency of inspections, estimates of assets covered, and methodologies employed

Through implementation of the company Environmental Performance Practices (EPP) we have set VOC Leak Detection and Repair (LDAR) programs in order to detect and repair methane leaks. These guidelines make up a set of common standards regardless of the geographical area we are operating and local legislation in each country.

We are also working on an internal standard to carry out LDAR at least once a year in each facility. We plan to increase the frequency in our gas facilities in the future (for instance in our facilities in US carry out LDAR quarterly).

Hybrid LDAR methodology includes Optimal Gas Imaging (OGI) cameras in order to detect some leaks and use field ionization flame equipment's to quantify the mass emission of CH4 y VOCs.

OG7.4

Please indicate the proportion of your organization's methane emissions inventory estimated using the following methodologies (+/- 5%)

Methodology	Proportion of total methane emissions estimated with methodology	What area of your operations does this answer relate to?
Direct detection and measurement		
Engineering calculations		
Source-specific emission factors (IPCC Tier 3)	>75%	All
IPCC Tier 1 and/or Tier 2 emission factors		

OG7.5

Please use the following table to report your methane emissions rate

Year ending	Segment	Estimate total methane emitted expressed as % of natural gas production or throughput at given segment	Estimate total methane emitted expressed as % of total hydrocarbon production or throughput at given segment

OG7.6

Does your organization participate in voluntary methane emissions reduction programs?

Yes

OG7.6a

Please describe your organization's participation in voluntary methane emissions reduction programs

Natural gas (lowest carbon-intensive fossil fuel) represents a great portion of our business (65% of the production and 75% of our reserves). Repsol is undertaking real and sustainable actions to manage emissions and enhance the role of natural gas in the near future.
Repsol as signatory company of the OGCI Joint collaborative declaration has made a public commitment to collaborate with the other signatory companies in different areas, including natural gas developments:
- Contributing to increasing the share of gas in the global energy mix
- Ensuring that the natural gas we provide for power generation results in significantly lower life cycle emissions than other fossil fuels
- Reducing methane emissions from our operations
On June 10th 2016 Repsol has signed the Memorandum of the Understanding of the Climate and Clean Air Coalition Oil & Gas Methane Partnership initiative (CCAC-OGMP). This endorsement is fully aligned with Repsol policies and commitment as part of the OGCI

OG7.7
Did you have a methane-specific emissions reduction target that was active (ongoing or reached completion) in the reporting year and/or were methane emissions incorporated into targets reported in CC3?
No

OG7.7c
Please explain: (i) why you do not have a methane-specific emissions reduction target or do not incorporate methane into your targets reported in CC3; and (ii) forecast how your methane emissions will change over the next five years
Currently, Repsol has not specific targets for methane, nevertheless the company plan and long term target (2020) are related to avoidance of CO2 eq. That is why our strategy about methane reductions is included in our GHG reduction plans.
After we joined Oil&Gas Methane Partnership (OGMP) group belonging to Climate & Clean Air Coalition (CCAC) initiative under UN Environment we are working on specific methane reduction implementation plan. This plan will include a specific timeline including our operating gas facilities. Our first report to the initiative will be in 2018.
In addition, we are working within CCAC-OGMP and OGCI to develop better methane inventories (following CCAC technical guides) and to invest in detection and quantification technologies.