

Repsol CO₂ Emission Reduction Strategy

Safety and Environment Unit
Strategy & Control General Unit



9th April 2014

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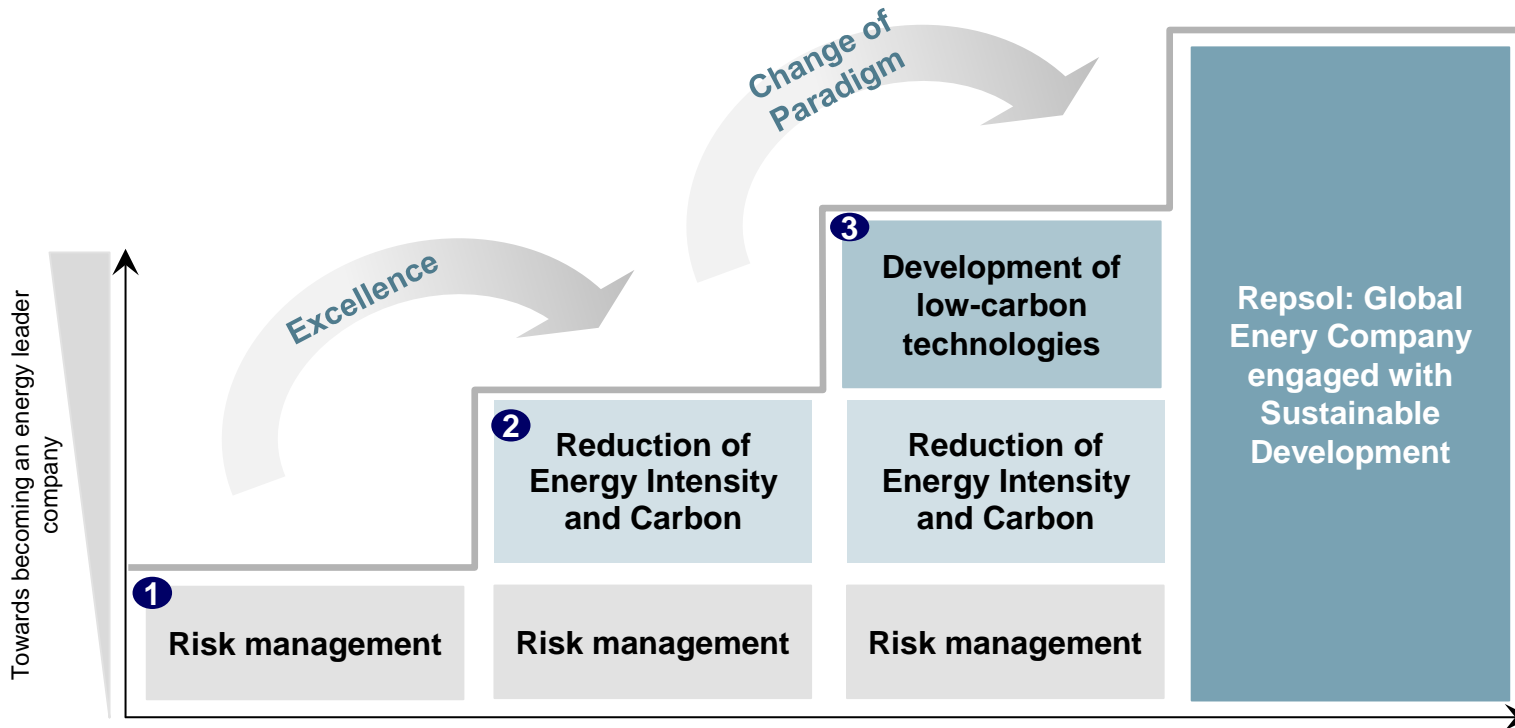
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Repsol action to reduce GHG emissions



Climate Change Strategy

Our route



Commitment

- First Company of the Oil&Gas sector on showing commitment with the Kioto protocol. Repsol publicly formalized its **Position on the Climate Change in 2002**, when there were still some uncertainties on the entry into force of the Kioto Protocole.

Emissions Reduction

- Definition in 2005 of a reduction of 1 million tons of CO₂, reviewed to **2.5 million tons** during the period 2006-2013, and complying with it a year in advance.

CDM Projects

- Approval by the CDM Executive Board of the United Nations on the **Methodology** based on flare gas recovery projects (approval of 2 CDM projects with this methodology).
- Approval of a Fuel Change Project in Peru becoming thus the first project of this type registered at a world level (**PoA**).

National and international initiatives

- Approval in 2012 and 2013 by the OECC (Climate Change Spanish Agency) of the **CLIMATE Project** on electrical mobility promoted by Repsol
- Participation on the **Meth Panel** at the Climate Change Framework Convention of the United Nations for the definition of CDM Projects methodologies.

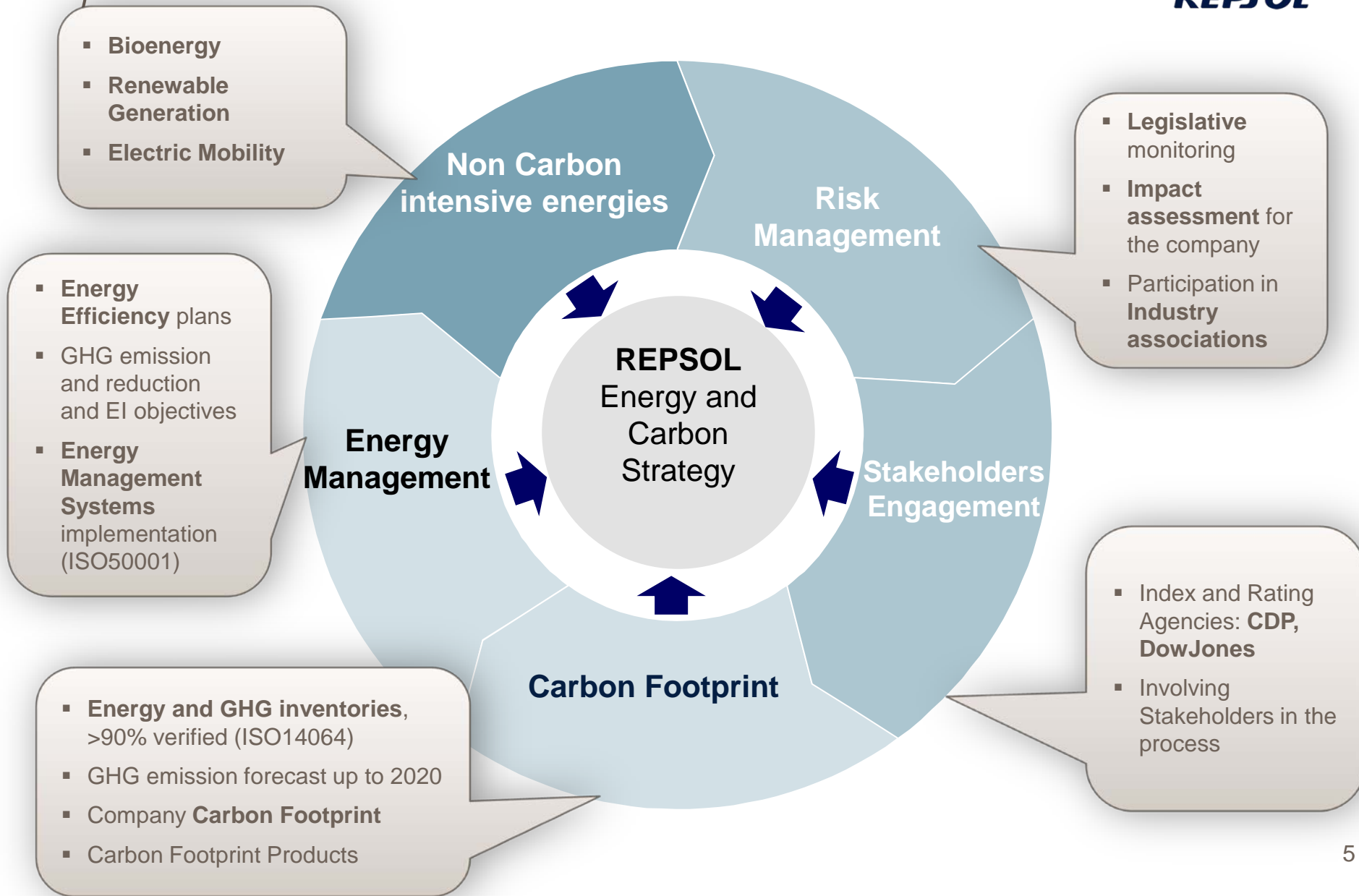
Operational Excellence

- Energy Management: La Coruña was the first refinery in the entire world to achieve the **ISO 50.001 certificate**.

Accuracy and Transparency

- More than **90% of our inventory has been verified under the ISO14.064 standard**.
- First verification of Product Carbon footprint of the product (LPG in bulk Peru, 2013), becoming one of the first companies at world level to verify under the ISO 14.067 standard.
- **Maximum scoring on transparency on the index CDLI of CDP**.

Repsol action to reduce GHG emissions



EnEf Improvement 2006-2013



2006 – 2013

Strategic targets of Energy and GHG emissions reductions in the medium term.

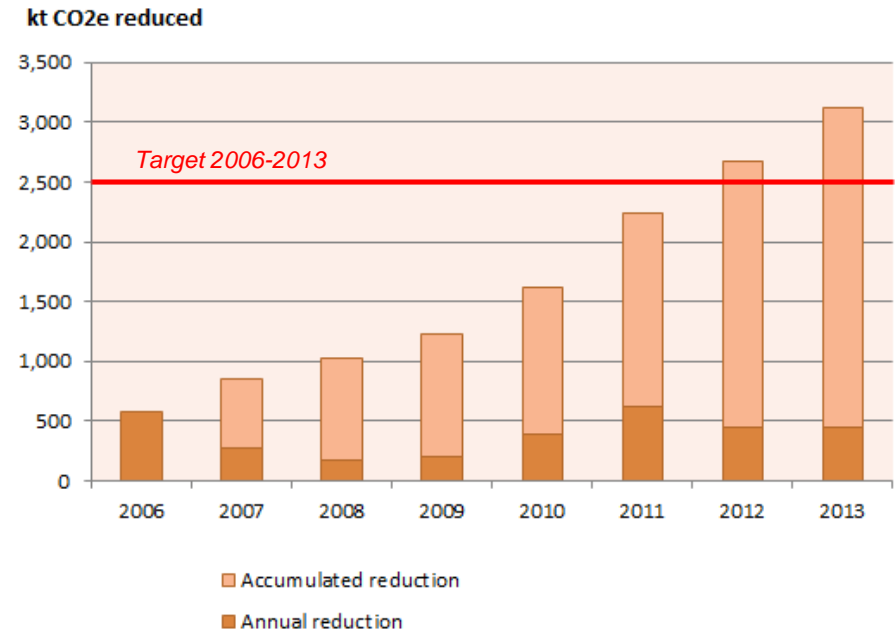
Company objectives:

- Reduction of **2,500,000 t CO₂ eq** for 2006 - 2013 in relation to the "business as usual" case



- Specific Plans of Refining and Chemical Business

GHG emissions reduction



- Repsol achieved a **total reduction of more than 3.0 Mt CO₂** from 2006-2013, all of them certified according to the ISO 14064 standard.
- Practically 50% of the reduction happened along 2011-2013.

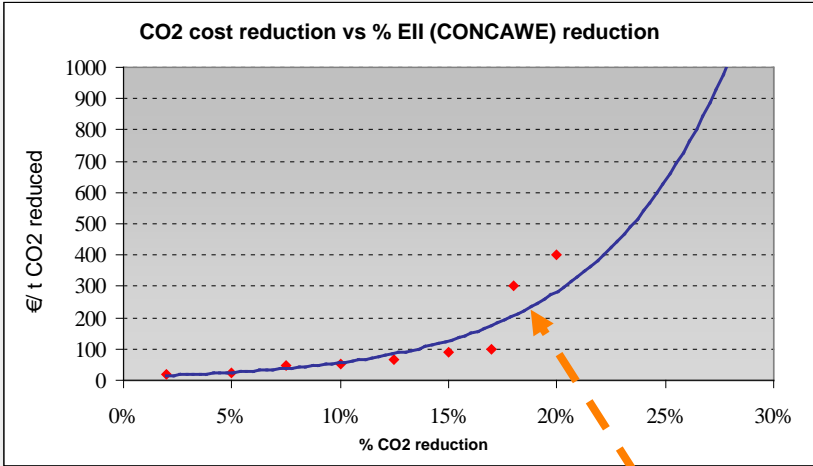
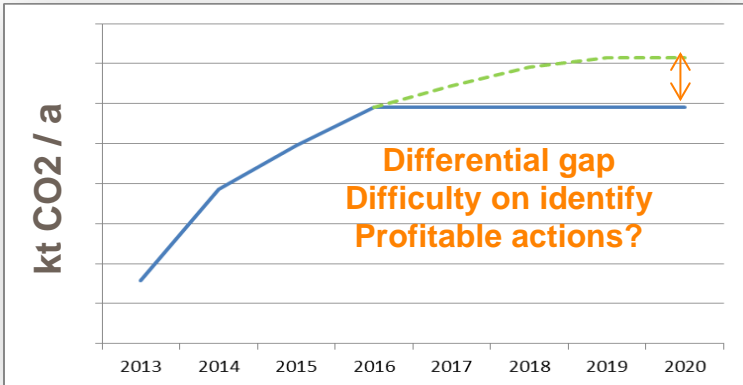
Long-term EnEf improvement



Long term

It is more and more difficult to identify new opportunities with increasing Investment / achieved reduction ratios

i.e.. Company CO₂ Reduction



**Increasing
Investment / CO₂
Ratio**

The long term improvement will need higher costs / implementation timing
→ 2014-2020 Plan

New approaches to look for opportunities + Identification of technology advances + Extension of best practices / EnMS to different Business

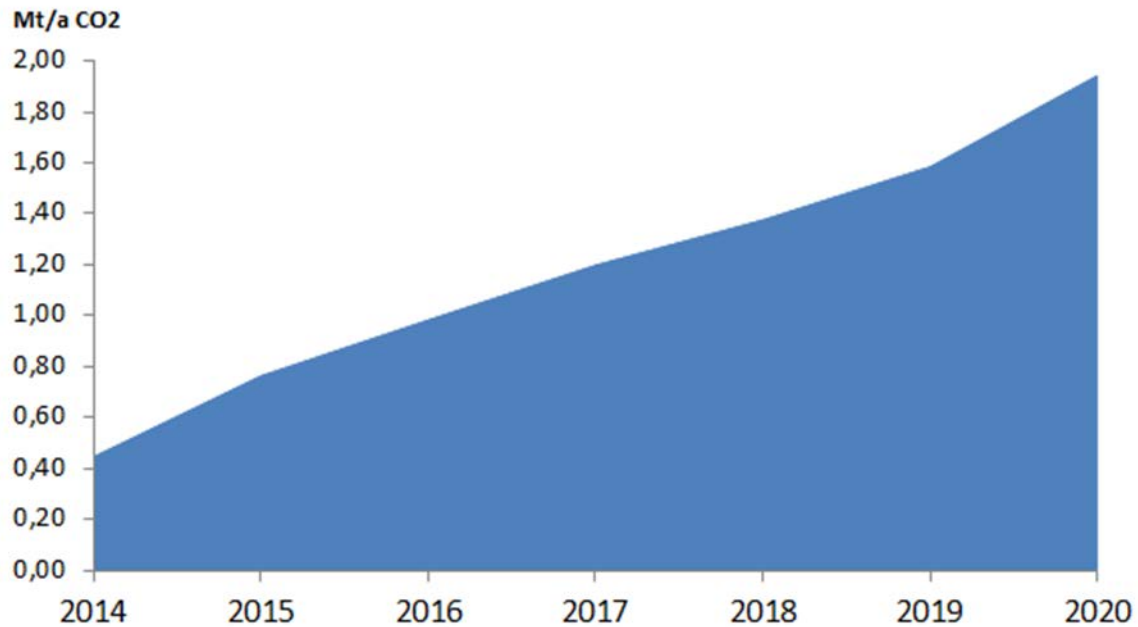


2014-2020 Objectives

Energy and CO₂ emissions Reduction



Reduction of **1,900,000 t CO₂ eq** for 2014 - 2020 in relation to the “*business as usual*” case



Very ambitious Long term Plan with a high technological challenge

2014-2020 Objective

Features of the Repsol Energy and CO₂ Emissions Plan



- Repsol uses international energy schemes standards to systematically implement **energy management systems** (EnMS) using ISO 50001 standard as a reference (7 installations are already certified).
- We are conducting **energy studies and audits** to identify opportunities to reduce our consumption and emissions (15 Energy audits in all of our industrial refining and petrochemical centers in Spain).
- We are developing an **Energy Review – Production** (ER-P) methodology to identify new energy efficiency opportunities in the Upstream area.
- **About 150 efficiency actions** are taken on every year in our facilities and activities as part of the long term plans to reduce energy consumption and CO₂ emissions.
- About **140 M€** investment in CO₂ and energy efficiency measures in 2012-2013.

CO₂ EMISSIONS REDUCTION PLAN



Refining B.A.

- I. Background
- II. Four Plan's Drivers: environmental responsibility, legislation, competitiveness and the commitment of all our employees
- III. Objective and Action Plan
- IV. Future challenges

A few figures

In 2010 Repsol Spanish Refineries emitted around 7,000,000 t of CO₂

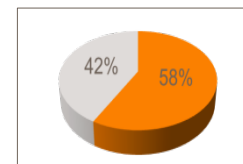
- Two weeks of European flights
- Less than double the emissions of Iceland
- The emissions of 1,000,000 people a year



Motivation

Why reduce our CO₂ emissions?

- Global warming / responsibility
- Compliance with legislation / ETS Directive
- Competitiveness / energy costs (60% of costs)
- History of commitment of the organization to efficiency and energy saving



Four Plan's Drivers



1

Global Warming and Responsibility

Environmental responsibility improves our quality of life: our refineries stand alongside the population, including our employees' families and their surroundings.

Coruña Refinery

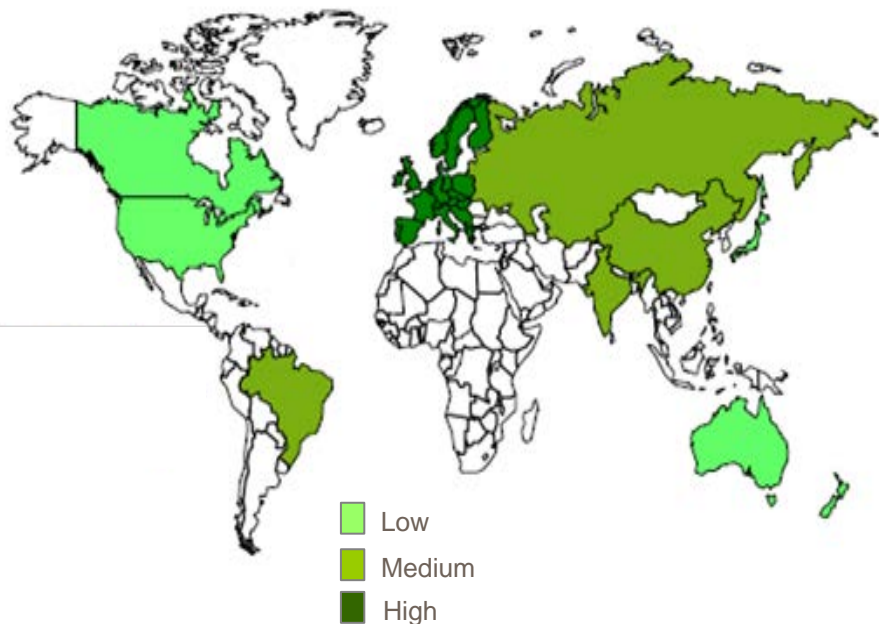


2

ETS Directive

Compliance with legislation
Increasingly stringent European Directives, more pressure on European products

Degree of regulative measures



Phase 1: 2005-2007
Learning phase. No reduction targets.

Phase II: 2008-2012
8% reduction in 2012 emissions compared to 1990 base line.
Start of the CO₂ emission allowances trade (valued at 10%).

Phase III: 2013-2020
22% reduction in 2020 emissions compared to 1990 base line.
At least 50% of emissions allowances are acquired by auction. Free allocations based on efficiency by sectors.

Four Plan's Drivers



3

Competitive Energy Costs

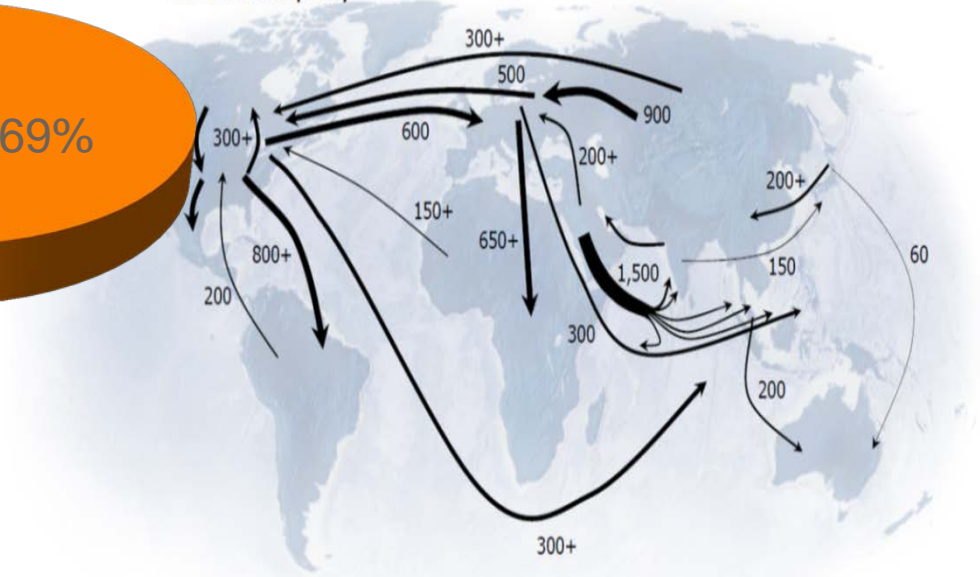
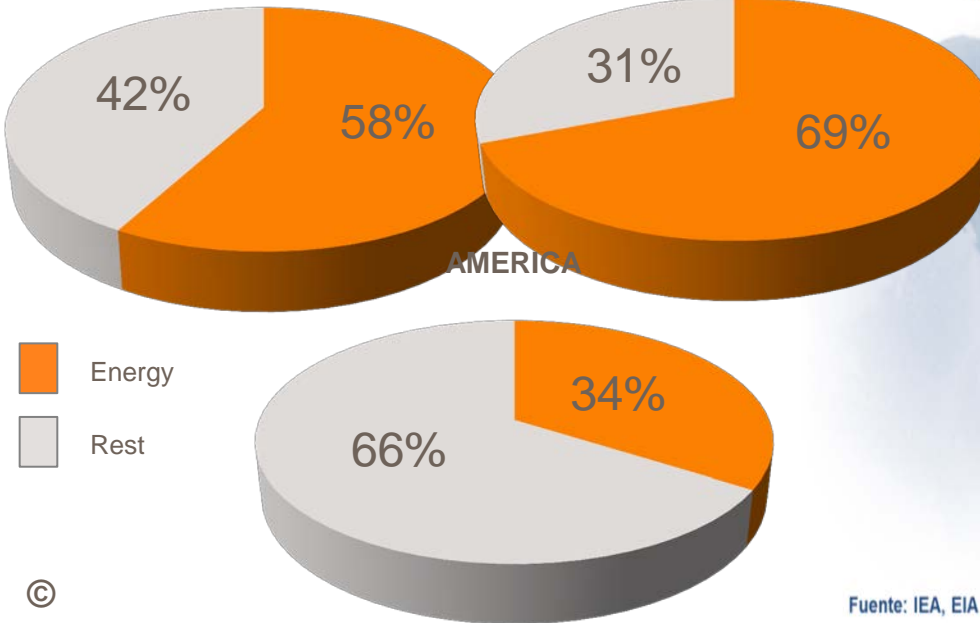
- ✓ Competitiveness ensures employment
- ✓ Energy makes up for 60% of operating costs in Europe
- ✓ We produce commodities. Production costs have modified the products trade flows.

EUROPE

ASIA

Worldwide Oil Products Trade Flow (2012)

Thousand barrels per day



Fuente: IEA, EIA y BP

Four Plan's Drivers

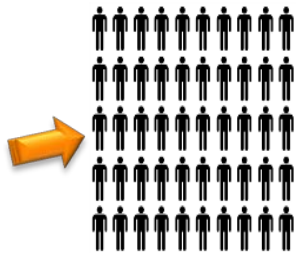


4

Organization's Commitment

- ✓ History of commitment of the organization to efficiency and energy saving
- ✓ The involvement of all employees based on new organizational models.

1992-2004 2005-2010 2011-



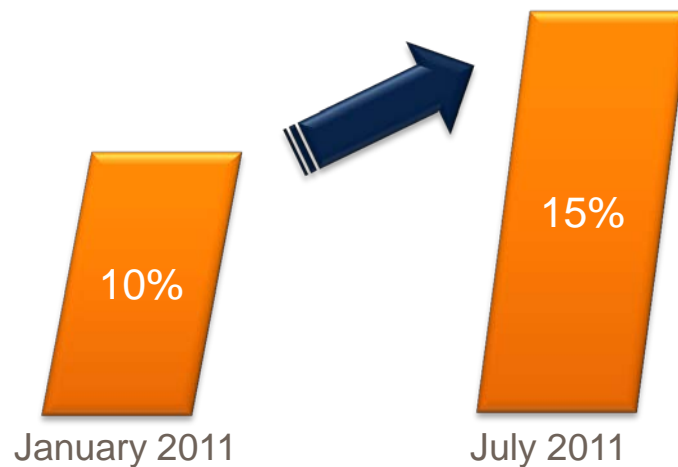
Multidisciplinary teams
50 people



Emissions Reduction Plan



Initial Objective



REDUCTION OF 15% OF CO₂ EMISSIONS

IN 2016 COMPARED TO 2010 (*)

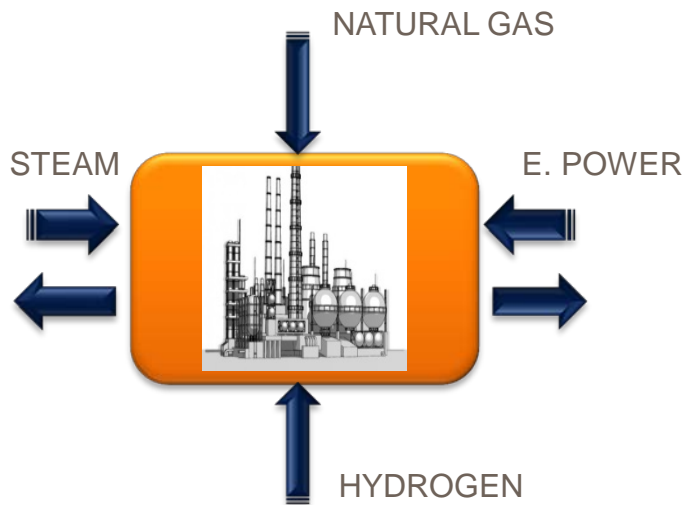
Emissions Reduction Plan



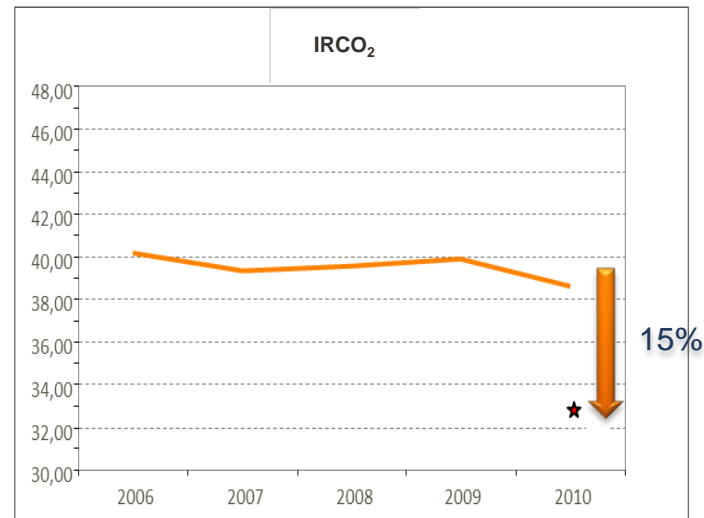
1

How to measure the objective?

- ✓ CO₂ emissions from refineries depend on their activity
- ✓ Defined a CO₂ Reduction Indicator (IRCO₂) , based on CONCAWE CWT methodology.
- ✓ To measure the progress of our Plan Objective in homogeneous terms



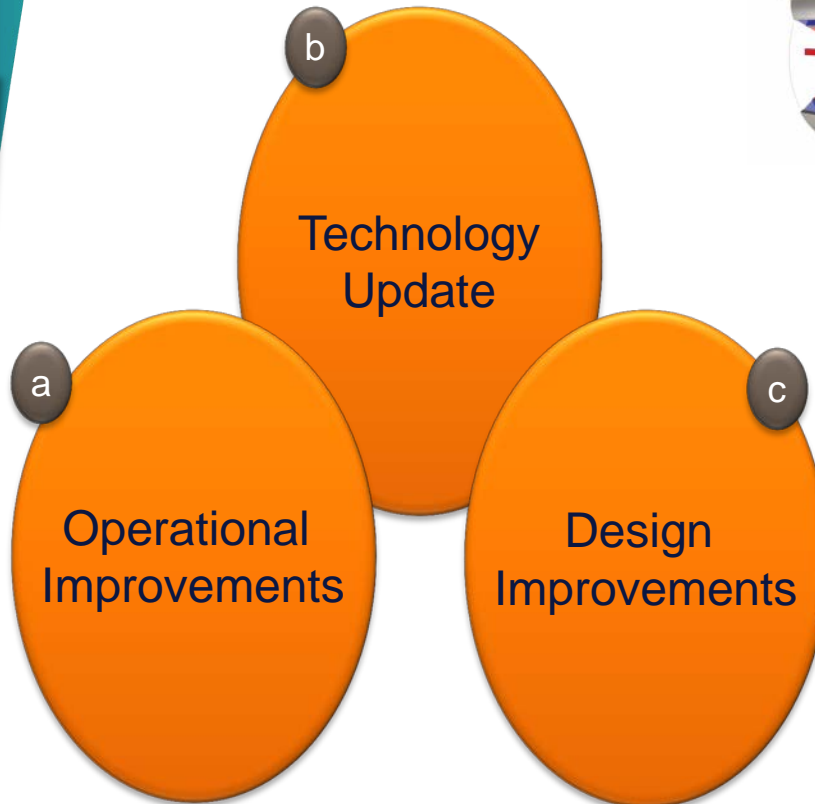
$$\text{IRCO}_2 = f(\text{CO}_2 \text{ emissions, CWT})$$



2

Action lines

- ✓ Replacement of current equipment with more efficient equipment



- ✓ Energy efficiency as a basic component of the operation
- ✓ Use of fuel with lower emissions

- ✓ Incorporation of Energy Efficiency criteria in project design and construction phases

2a

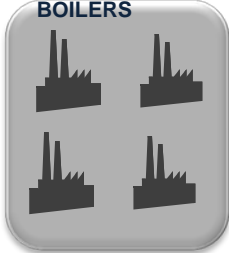
Operational Improvements

Energy efficiency as a basic component of the operation

STEAM NETWORK MANAGEMENT

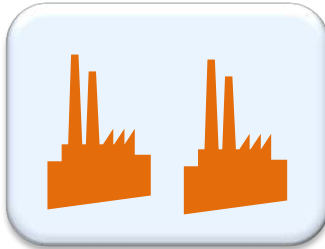
25,000 t CO₂ reduction

OLD REFINERY BOILERS



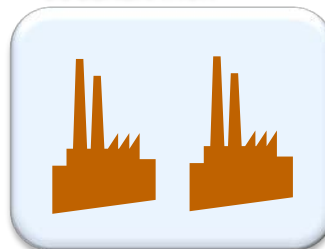
Definitive closure of old Boilers

NEW BOILERS PROJECT



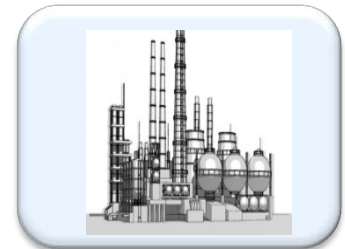
Hot boilers with minimum consumption for steam or electric failures

COGENERATION



Steam network control with supplemental firing

STEAM PROCESS



Minimize steam consumption and maximize the heat recovery

2b

Technology Update

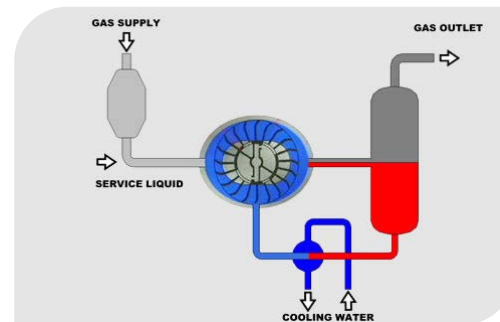
Replacement of current equipment with more efficient equipment

FLARE GAS RECOVERY

Send recovered gases to the FG system and avoid burning them in the flare.



4,100 t CO₂ reduction



2c

Design Improvements

Incorporation of Energy Efficiency criteria to project design and construction phases.



SOUR WATER AND SULPHUR RECOVERY UNITS MODIFICATIONS

13,000 t CO₂ reduction



TANK ISOLATION

3,800 t CO₂ reduction



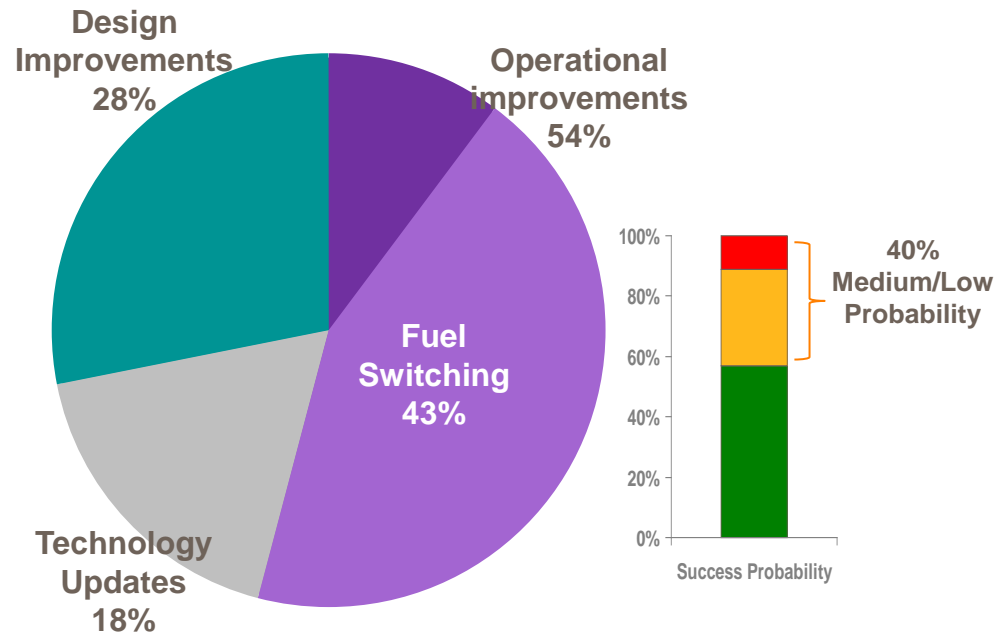
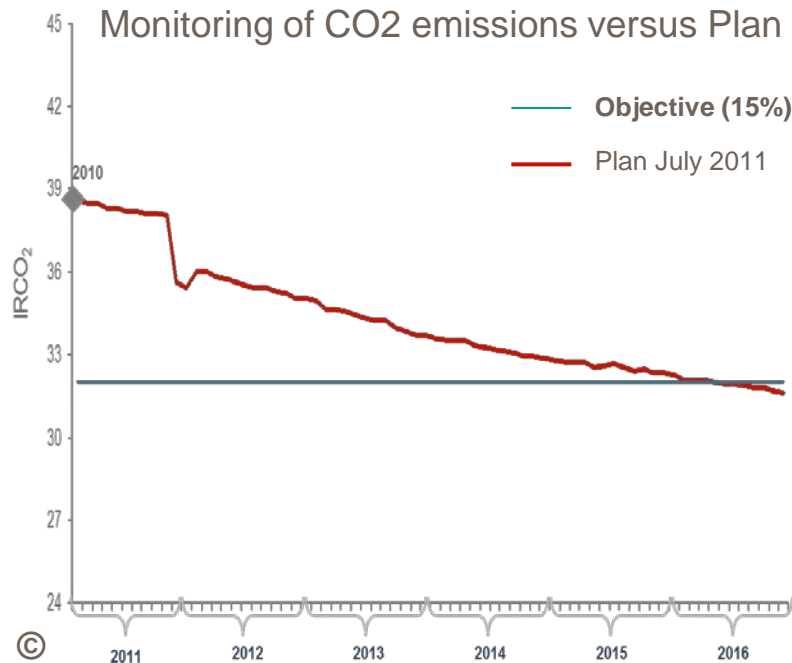
VACUUM UNIT IMPROVEMENT

4,300 t CO₂ reduction

3

Creation of an inventory of actions

July 2011: inventory with 150 actions that reduced 1.6 Mt of CO₂ emissions



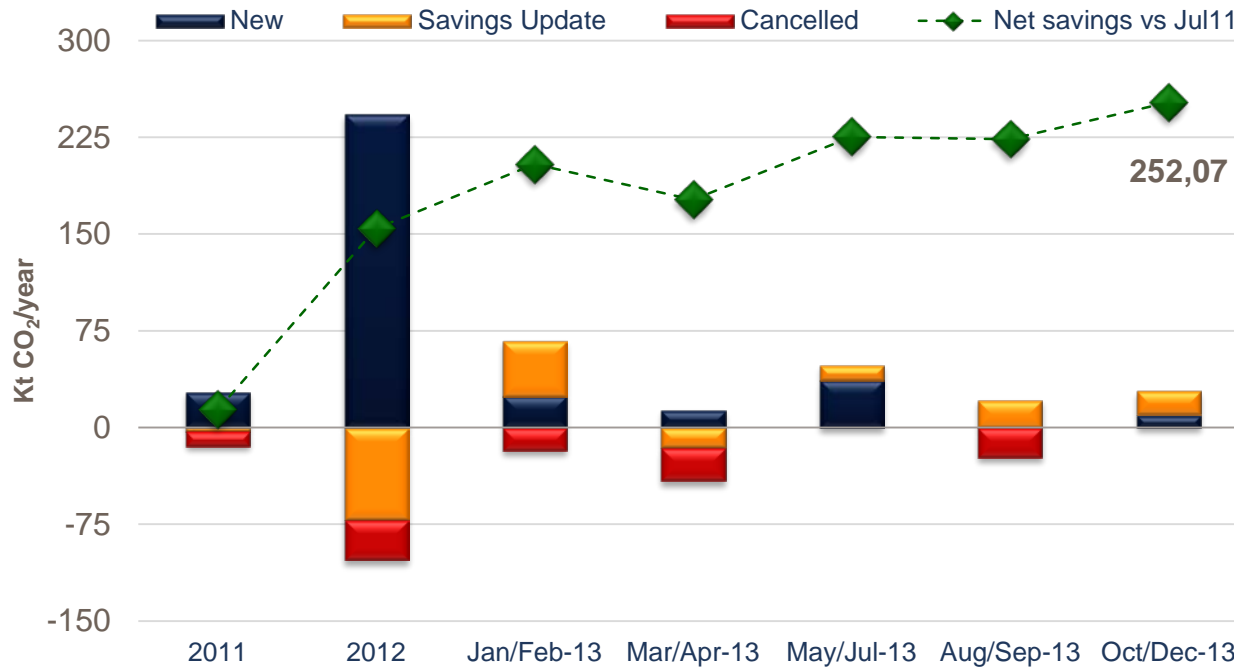
Emissions Reduction Plan



Results

There are currently 299 actions in the inventory, equivalent to a reduction of 1.8 Mt CO₂ and an investment of 300 M€

In December 2013, 165 actions were finished saving 1.1 Mt CO₂

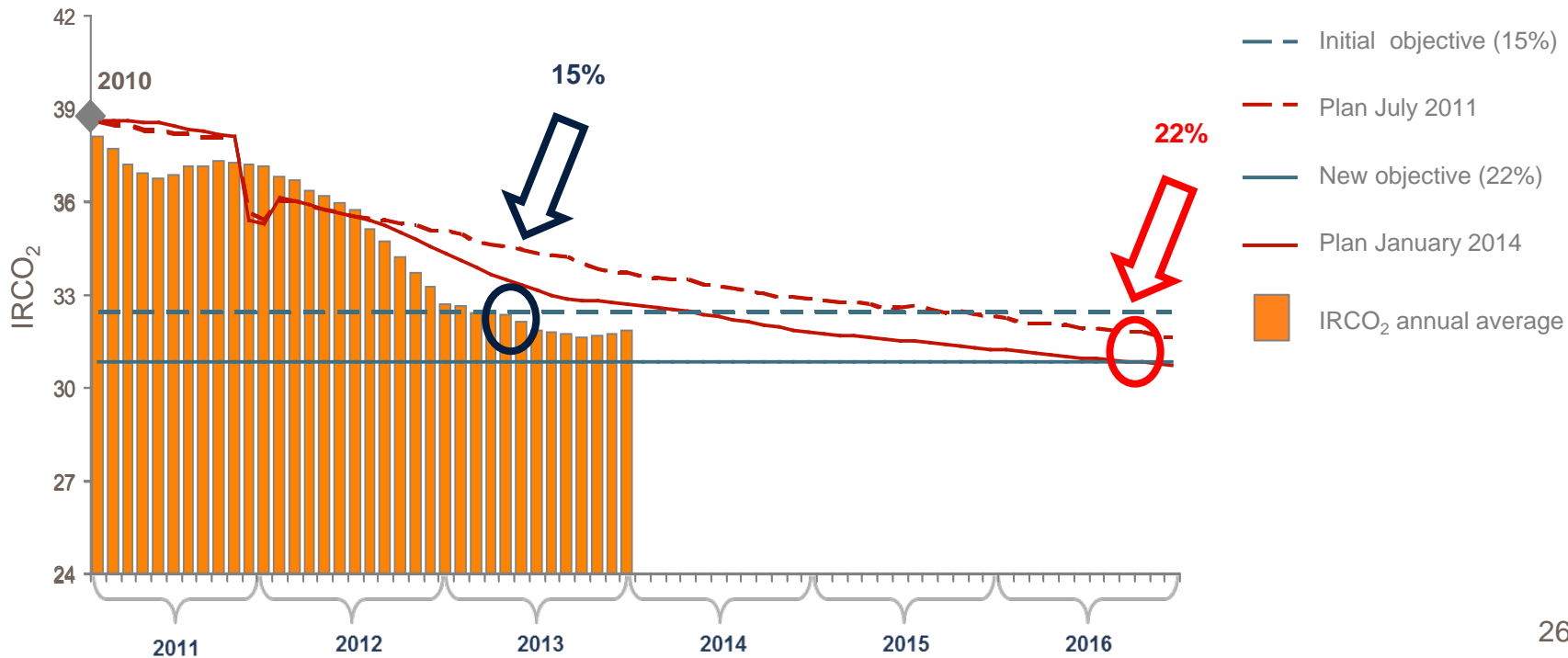


Emissions Reduction Plan



New Reduction Objective

We have achieved the 15% CO₂ reduction three years ahead of time, so we are setting a new objective of 22% in 2016 compared to 2010

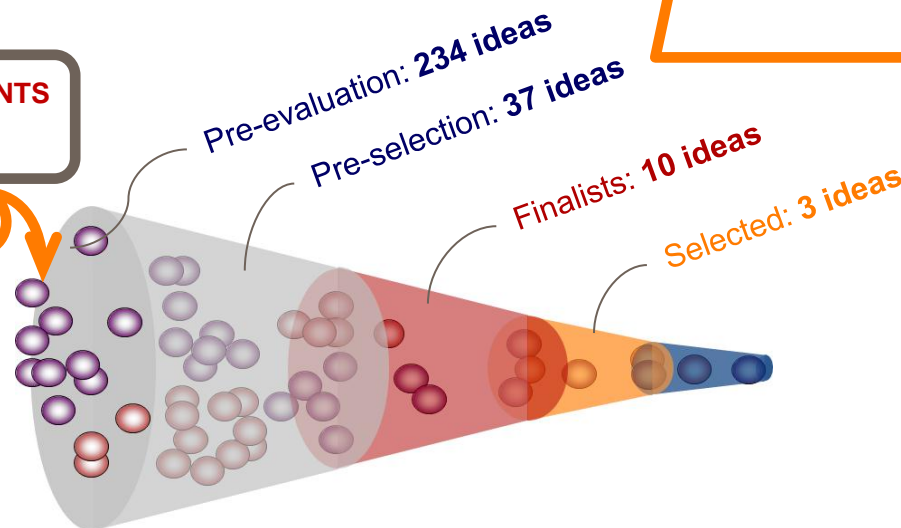


Generation of New Ideas

4 main tools to generate new reduction opportunities

- ⌘ Ideas campaign
- ⌘ Challenges deployment
- ⌘ Creativity workshops
- ⌘ Open innovation

1189 PARTICIPANTS
395 IDEAS



THANK YOU

