

# Repsol CO<sub>2</sub> Emission Reduction Strategy

Safety and Environment Unit  
Strategy & Control General Unit



9th April 2014

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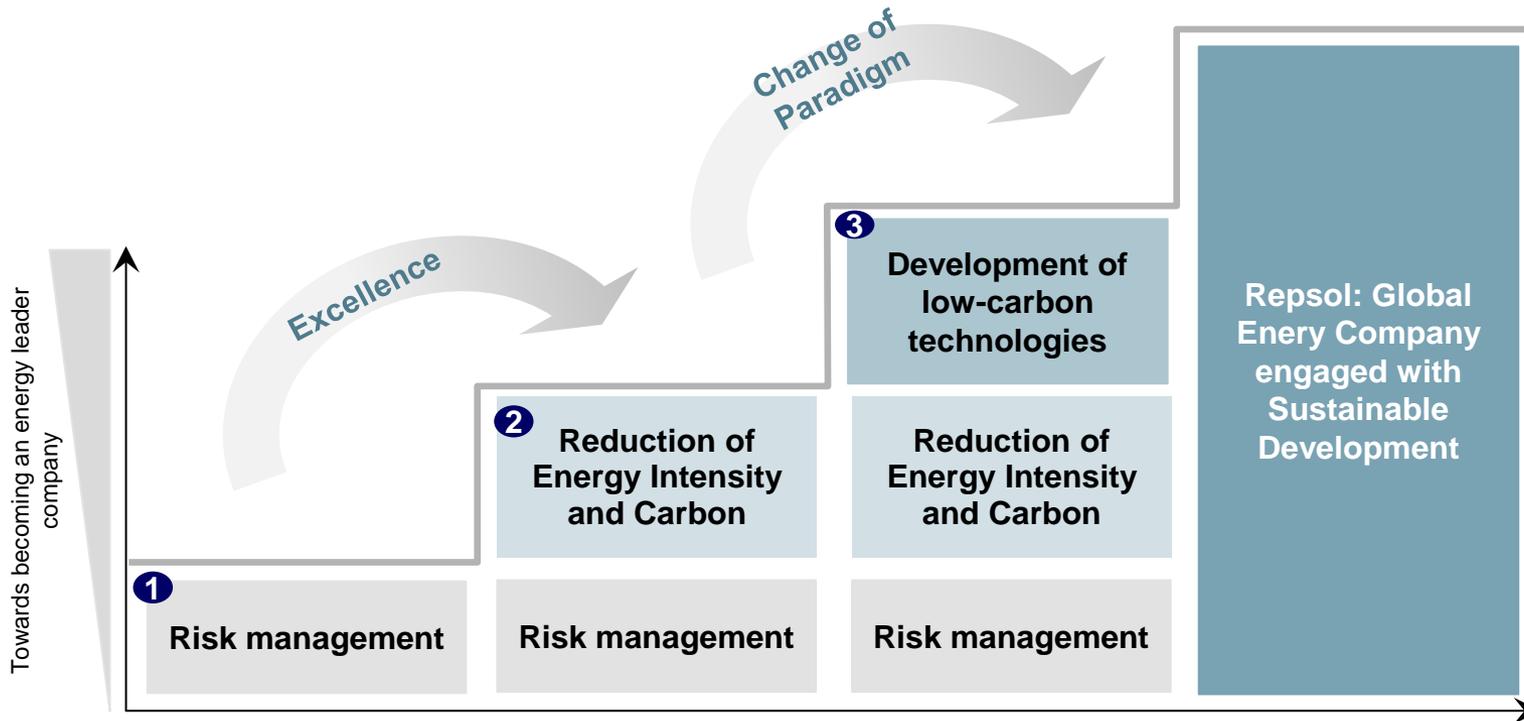
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# Repsol action to reduce GHG emissions



# 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 CO<sub>2</sub>, 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.

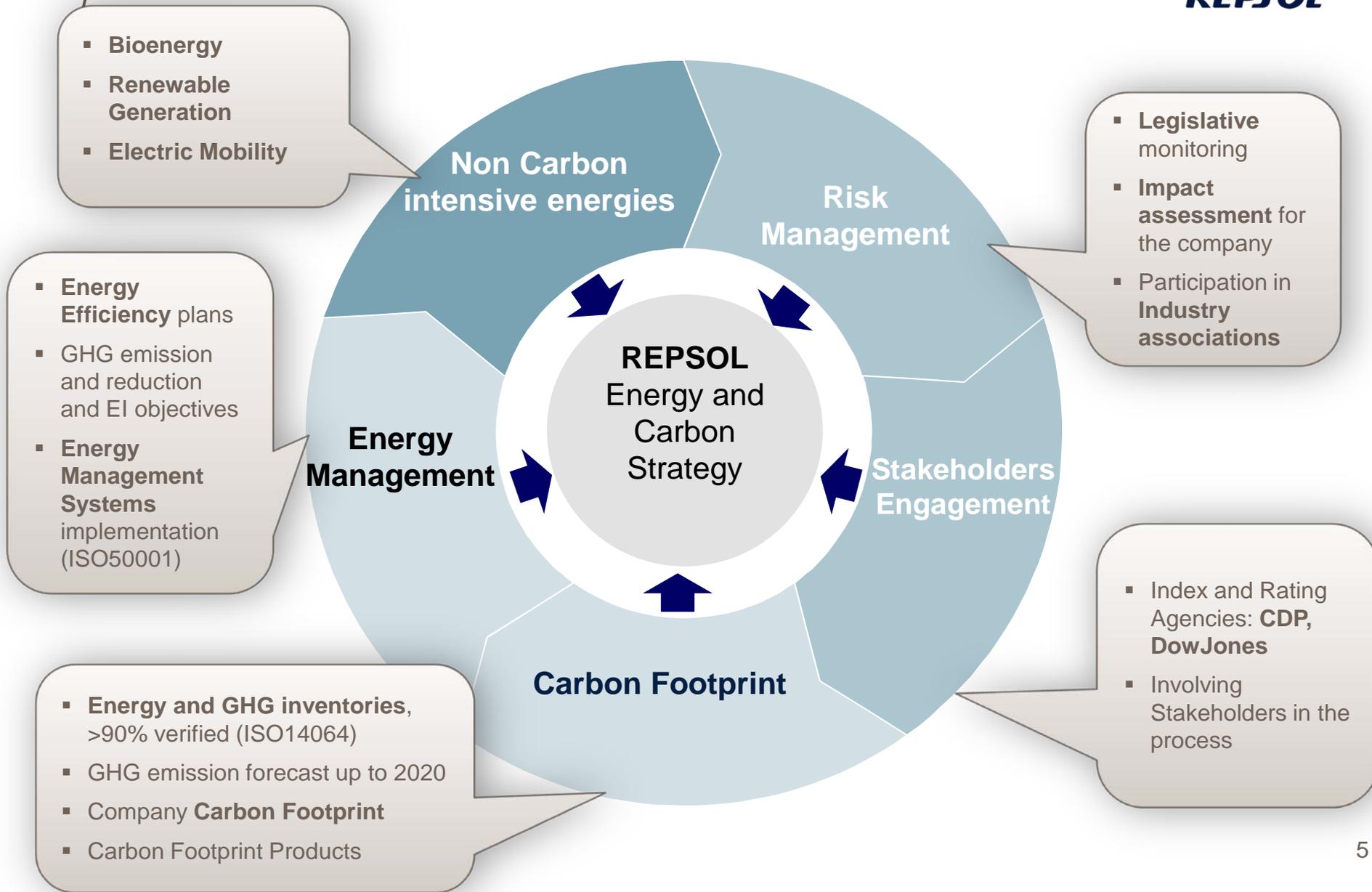
### Operational Excellence

- 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:

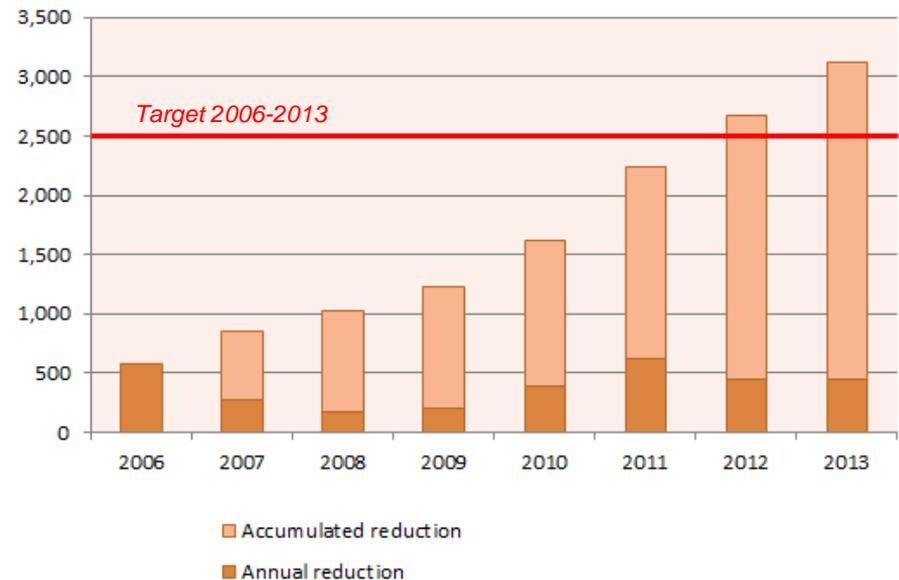
- Reduction of **2,500,000 t CO<sub>2</sub> eq** for 2006 - 2013 in relation to the "business as usual" case



- Specific Plans of Refining and Chemical Business

## GHG emissions reduction

kt CO<sub>2</sub>e reduced



- Repsol achieved a **total reduction of more than 3.0 Mt CO<sub>2</sub>** from 2006-2013, all of them certified according to the ISO 14064 standard.
- Practically 50% of the reduction happened along 2011-2013.

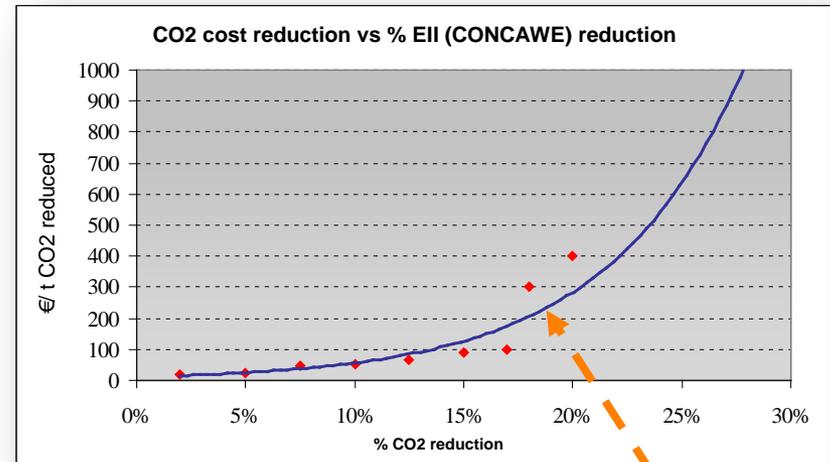
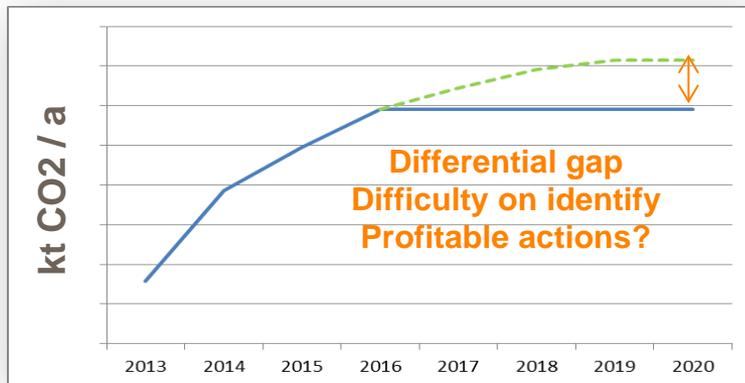
# Long-term EnEf improvement



Long term

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

i.e.. Company CO<sub>2</sub> Reduction



Increasing Investment / CO<sub>2</sub> 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

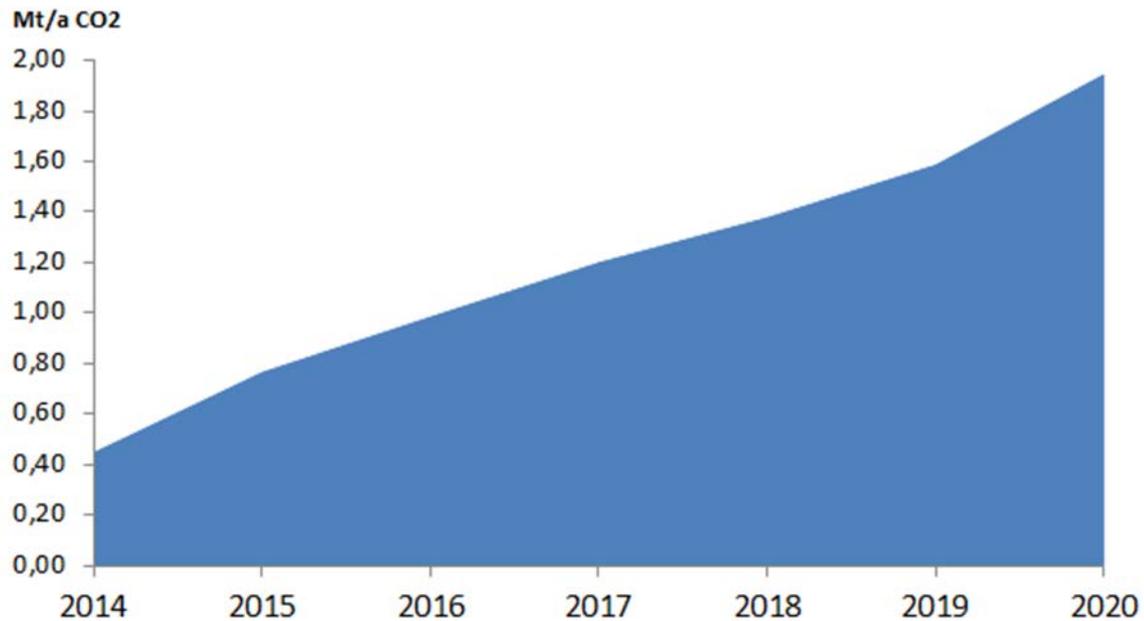


# 2014-2020 Objectives

## Energy and CO<sub>2</sub> emissions Reduction



Reduction of **1,900,000 t CO<sub>2</sub> 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 CO<sub>2</sub> 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 CO<sub>2</sub> emissions.
- About **140 M€** investment in CO<sub>2</sub> and energy efficiency measures in 2012-2013.

# CO<sub>2</sub> 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 CO<sub>2</sub>

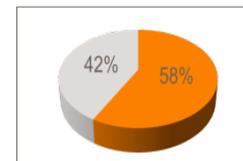
- Two weeks of European flights
- Less than double the emissions of Iceland
- The emissions of 1,000,000 people a year



## Motivation

### Why reduce our CO<sub>2</sub> 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

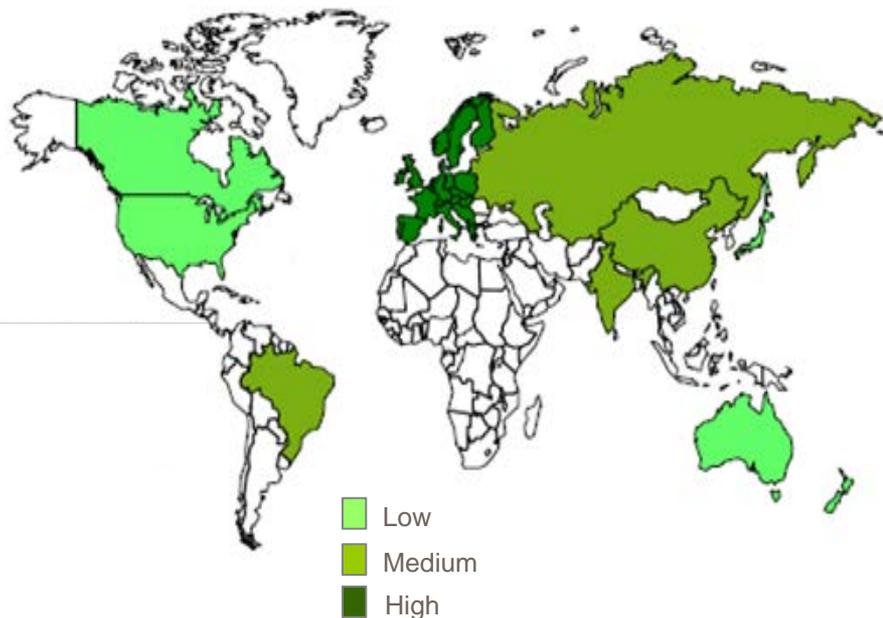


# 2

## 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 CO<sub>2</sub> 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

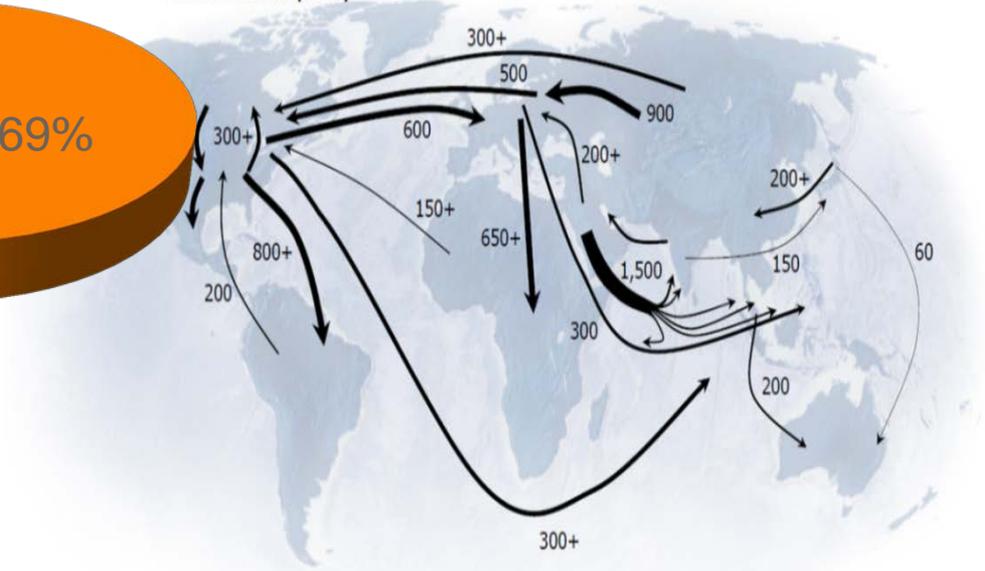
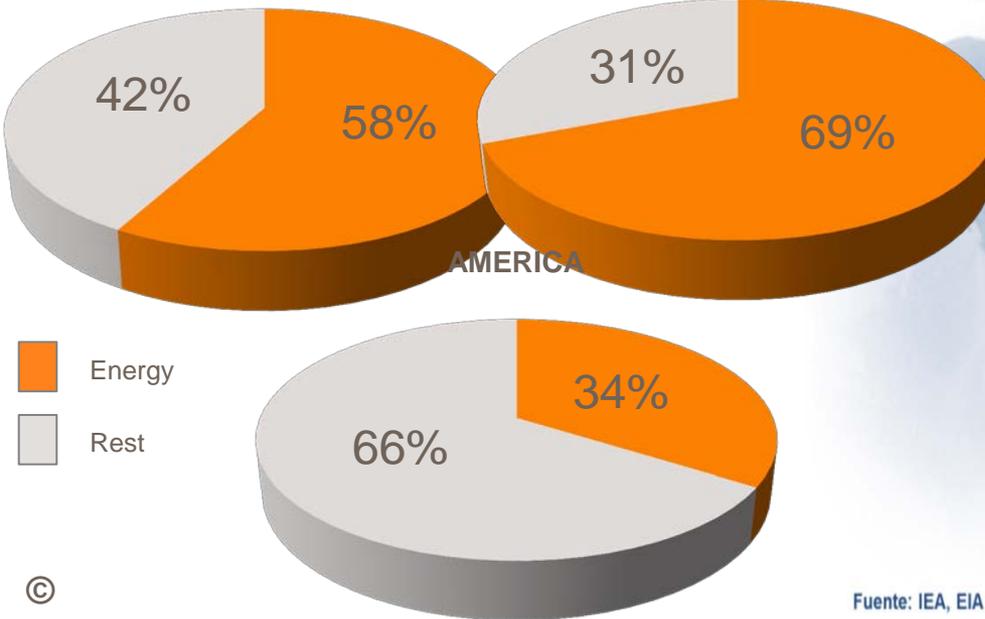
- ✓ Competitiveness ensures employment
- ✓ Energy makes up for 60% of operating costs in Europe
- ✓ We produce commodities. Production costs have modified the products trade flows.

EUROPE

ASIA

Worldwide Oil Products Trade Flow (2012)

Thousand barrels per day



Fuente: IEA, EIA y BP

# Four Plan's Drivers

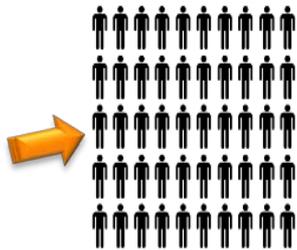


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## Organization's Commitment

- ✓ 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 CO<sub>2</sub> EMISSIONS**

**IN 2016 COMPARED TO 2010 (\*)**

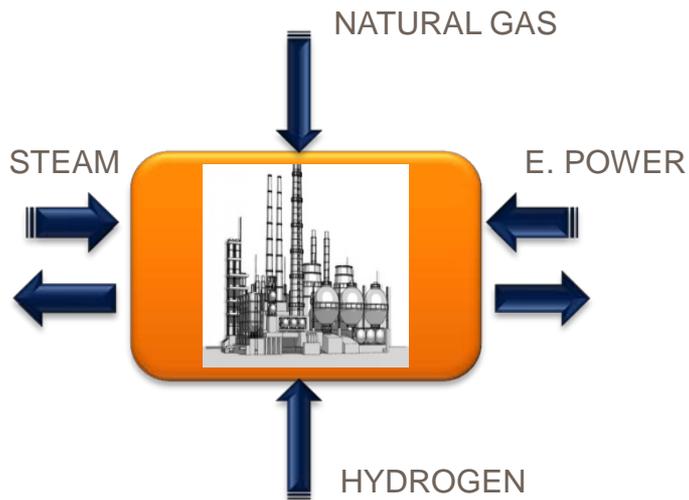
# Emissions Reduction Plan



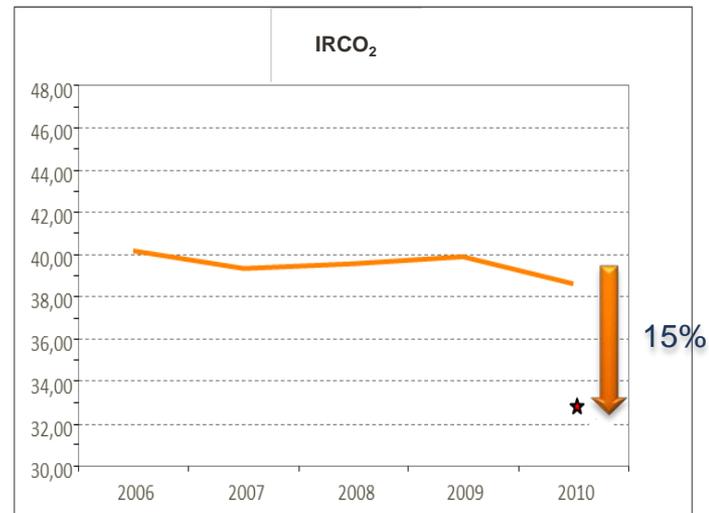
1

## How to measure the objective?

- ✓ CO<sub>2</sub> emissions from refineries depend on their activity
- ✓ Defined a CO<sub>2</sub> Reduction Indicator (IRCO<sub>2</sub>) , based on CONCAWE CWT methodology.
- ✓ To measure the progress of our Plan Objective in homogeneous terms



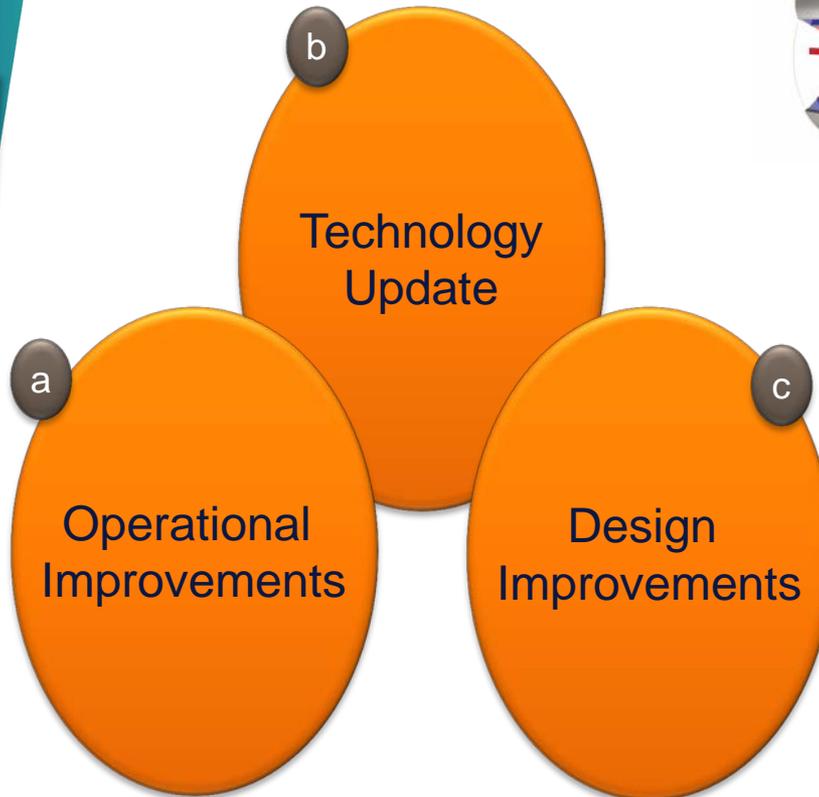
$$\text{IRCO}_2 = f(\text{CO}_2 \text{ emissions, CWT})$$



# 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

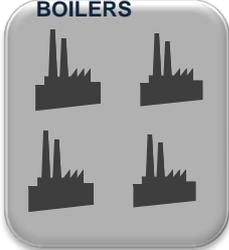
### Operational Improvements

Energy efficiency as a basic component of the operation

#### STEAM NETWORK MANAGEMENT

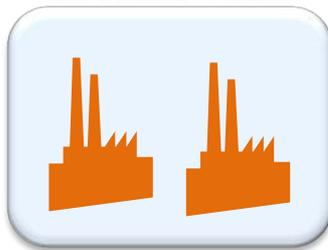
25,000 t CO<sub>2</sub> reduction

OLD REFINERY BOILERS



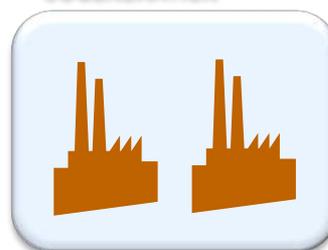
Definitive closure of old Boilers

NEW BOILERS PROJECT



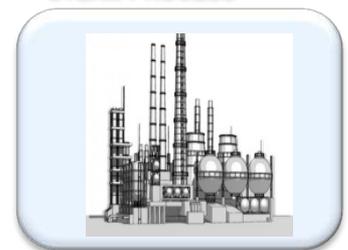
Hot boilers with minimum consumption for steam or electric failures

COGENERATION



Steam network control with supplemental firing

STEAM PROCESS



Minimize steam consumption and maximize the heat recovery

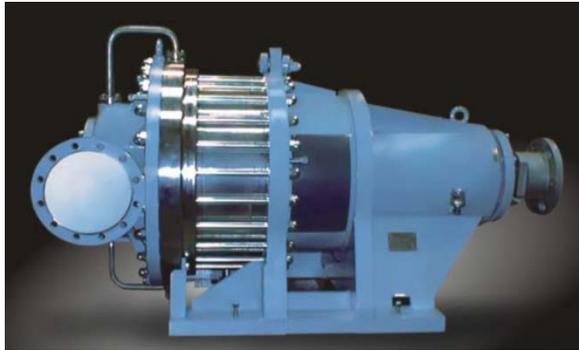
## 2b

### Technology Update

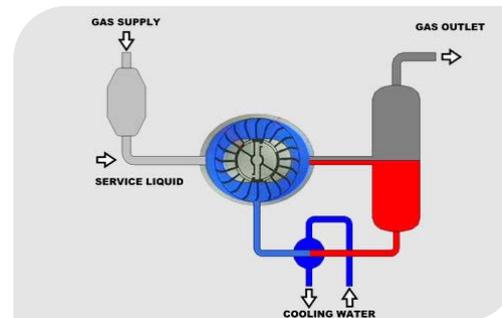
Replacement of current equipment with more efficient equipment

#### FLARE GAS RECOVERY

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



4,100 t CO<sub>2</sub> 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 CO<sub>2</sub> reduction**



**TANK ISOLATION**

**3,800 t CO<sub>2</sub> reduction**



**VACUUM UNIT IMPROVEMENT**

**4,300 t CO<sub>2</sub> reduction**

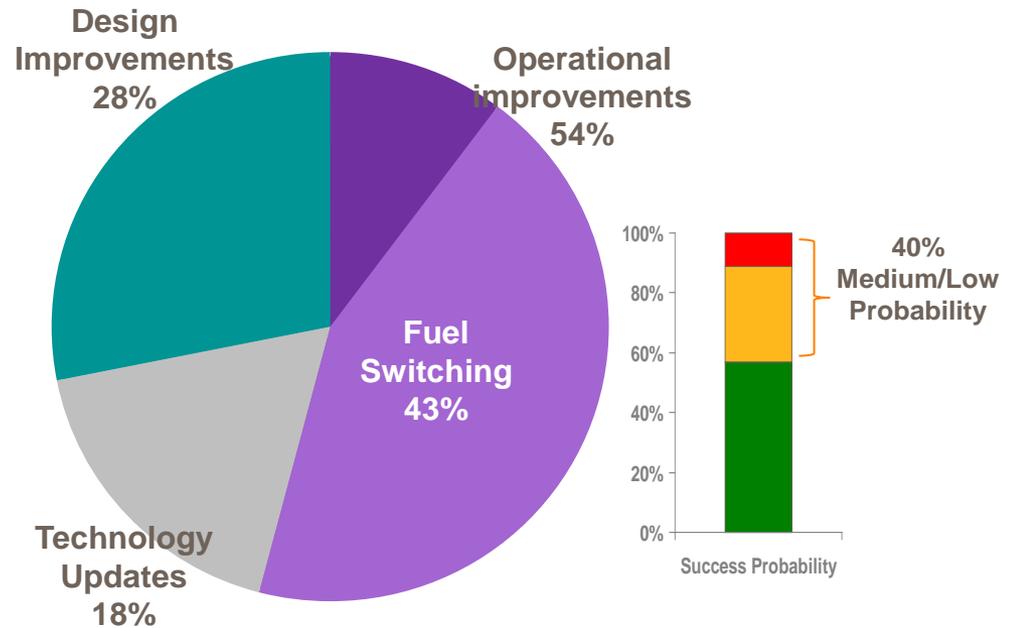
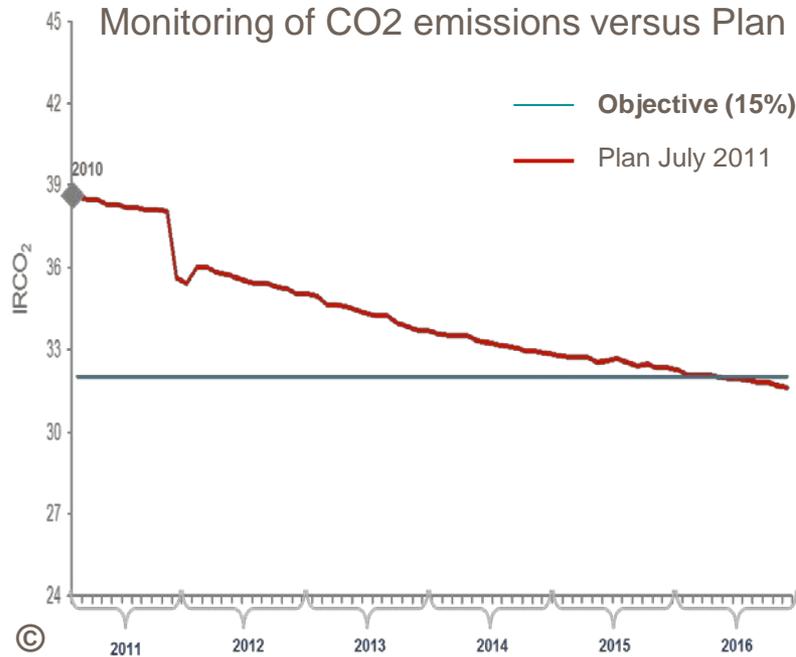
# Emissions Reduction Plan



3

## Creation of an inventory of actions

July 2011: inventory with 150 actions that reduced 1.6 Mt of CO<sub>2</sub> emissions



# Emissions Reduction Plan



## Results

There are currently 299 actions in the inventory, equivalent to a reduction of 1.8 Mt CO<sub>2</sub> and an investment of 300 M€

In December 2013, 165 actions were finished saving 1.1 Mt CO<sub>2</sub>

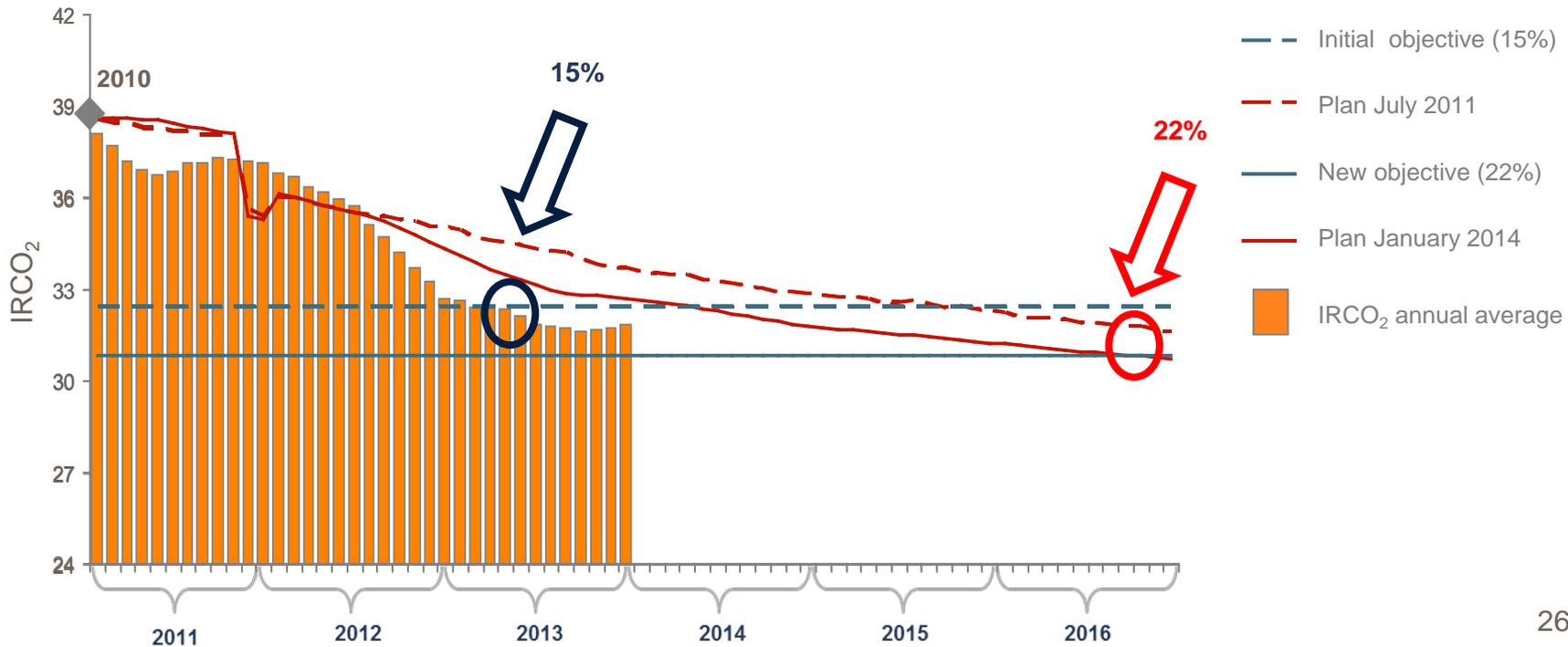


# Emissions Reduction Plan



## New Reduction Objective

We have achieved the 15% CO<sub>2</sub> reduction three years ahead of time, so we are setting a new objective of 22% in 2016 compared to 2010

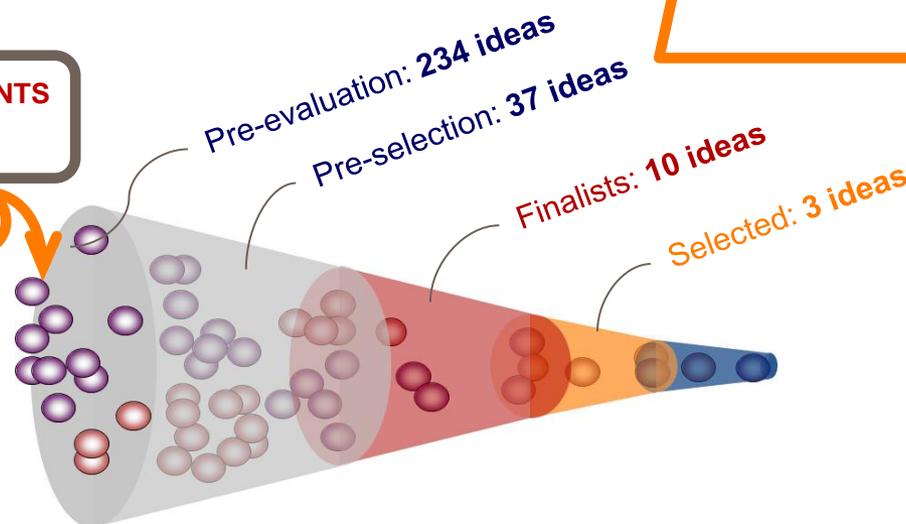


## Generation of New Ideas

4 main tools to generate new reduction opportunities

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

1189 PARTICIPANTS  
395 IDEAS



**THANK YOU**

