



# Repsol, 4<sup>th</sup> Sustainability Day

London, November 13<sup>th</sup>, 2017



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# Key messages Q3 2017

*Company overview and strategy*

## Upstream

### Production:

- ✓ Q3 17 = 693Kboe/d → 3% increase YoY
- ✓ Libya → ~25 Kboe/d in the quarter
- ✓ Startup of Juniper (T&T), ramp up of Flyndre and MonArb in the UK and Lapa and Sapinhoa in Brazil

### Exploration program:

- ✓ 3 exploratory wells completed **[1 positive]**
- ✓ As of 30th Sept. 8 exploratory and 1 appraisal in progress
- ✓ 2017 program: **17 wells [15 exploratory & 2 appraisal]**

## Downstream

### Refining:

- ✓ Refining margin indicator **7.0 USD/Bbl** in Q· 17
- ✓ **Planned maintainance** for the year **completed in 1H17:**
  - ✓ 3Q17 Utilization of the distillation units = 99%
  - ✓ 3Q 17 Utilization of the conversion units = 104%

### Petrochemicals:

- ✓ **Strong performance** → EBIT ~180M€ in line with record levels in early 2016

### Marketing:

- ✓ Higher volumes and margins in Service Stations

### FCF:

- ✓ Generation above 2 Bn€

## Corporate and Others

### Synergies and efficiencies:

- ✓ 2017 target **€2.1 Bn**
- ✓ **Accelerated** delivery of 2018 target

### Capex:

- ✓ ~3 Bn€ without impacting production volumes

### Corporation:

- ✓ Q3 17 Net debt €6,972 Mn€
- ✓ **Net Debt / EBITDA [x] = 1.1**
- ✓ Objective → Credit rating **BBB stable**

## 1. “Managing ESG issues within a long term strategy”

*James Hand, Canada BU Director*

*Fernando Ruiz, Director of Sustainability*

**A new long term Sustainability program:** 2020 goals

**“ESG within our “ACDC” projects”:** Duvernay. The benefits and impacts within a successful story of stakeholder engagement

## 2. “Increasing our Business resilience in 2018 and Beyond”

*Mariano Benito, Director of Finance*

*Antonio Lopez Rodriguez, Climate Change Manager*

**Carbon pricing:** An effective tool to improve our resilience

**Energy Efficiency:** the cornerstone to achieve the low emissions pathway

Our experience issuing a **Green Bond**



# Sustainability Plan

November 13th, 2017

# Sustainability Model



## Ethics and transparency

*We act responsibly and with integrity wherever we operate*

- Good governance practices
- Transparency
- Fiscal responsibility
- Anticorruption
- Fair competition
- Responsible political involvement
- Fair marketing and sales



## People

*We are committed to people and promote their development and social environment*

- Respect for Human Rights (labor rights and employment conditions, health, rights of vulnerable groups and others)
- Grievance mechanisms
- Diversity and work-life balance
- Talent retention
- Opportunity management (training and development, community dialogue, and social investment)



## Safe operation

*We guarantee the safety of our employees, contractors, partners, and the local community*

- Risk Management
- Incident Management
- Emergency Management
- Product Safety

The **Sustainability Plan** focuses on the **six axes** of Repsol's Sustainability Model, which was approved in **2016**



## Resource and impact management

*We consume the resources needed to generate power more efficiently and with the least possible impact*

- Circular economy (water, waste, energy)
- Other impacts (biodiversity, noise, odors, etc.)



## Climate change

*We want to be part of the solution to climate change*

- Efficient energy management
- Drive the reduction of GHG emissions
- Encourage the use of natural gas in electricity production
- Sustainable mobility
- Low-emissions economy model



## Innovation and technology

*We encourage innovation and incorporate technological advances to improve and develop ourselves and our environment*

- Boost innovative activity
- Use of new technologies
- Promote training and facilitate the development of the environment

# The Sustainability Plan:

*a public commitment to stakeholders*



## Global Sustainability Plan

### *Local Sustainability Plans*

*in countries and main facilities*

**8 countries in America**

**5 industrial facilities in Spain**

**In process of deployment in other countries of Europe, North America and South East Asia**

*The Global Sustainability Plan focuses on the six axes of Repsol's Sustainability Model, sets 2020 targets and it is yearly approved by the Executive Committee*

*The Local Sustainability Plans are the response of the Company to the local stakeholder's expectations. They are the local deployment of the Global Plan*



# The Global Sustainability Plan





# Global Sustainability Plan

## Our ambition

No cases of corruption in the activities carried out by the Repsol Group.

## 2020 Objectives

- 1 Inform all Repsol employees of what is expected of them in terms of prevention and the fight against corruption, as well as the mechanisms the Company places at everyone's disposal to make queries or report possible breaches of the Code of Ethics and Business Conduct and the Crime Prevention Model.
- 2 Develop and implement a global management model that will guarantee possible cases of corruption are prevented (as far as possible) and detected early.

## Lines of action 2017

- 1 Implement and develop legal compliance models that are adapted to local regulations in seven countries: Spain, Colombia, Canada, US, Russia, Italy, and Peru.
- 2 Create action guidelines for the Code of Ethics and Business Conduct.
- 3 Have a global Ethics and Business Conduct training program that ensures people know of the criteria established in the Code of Ethics and Business Conduct and how to report any possible breaches.



**Ethics and  
transparency**

**Anticorruption**

# Global Sustainability Plan

## Our ambition

Achieve maximum national and international standards in terms of Good Governance.

## 2020 Objectives

- 1 | Ensure that women occupy 30% of the seats on the Board of Directors.

## Lines of action 2017

- 1 | Incorporate shares as a form of payment for part of the Executive Directors' variable compensation. This way the compensation system follows the recommendations of the Good Governance Code of Listed Companies and the policies of the proxy advisors\* and institutional investors.
- 2 | Search for and include women among the potential candidates to fill vacancies for Independent Directors of the Board of Directors.

\* Proxy advisors: Firms contracted by investment funds to study the companies they are investing in and advise them on what position to take in shareholder meetings.



**Ethics and  
transparency**

**Good Governance  
Practices**

# Global Sustainability Plan

## Our ambition

Be publicly recognized as an honest and transparent company in tax-related matters.

## 2020 Objectives

- 1 | Ensure our Company does not operate in tax havens (except for unavoidable and legitimate business reasons) and simplify the corporate structure.
- 2 | Be rated as a "transparent" and "responsible" company by the organizations that carry out assessments, thanks to the publication of information that facilitates understanding of our tax policies and practices along with our tax contribution in the countries where we operate.
- 3 | Promote cooperative relationships with tax authorities and search for amicable solutions in financial disputes.

## Lines of action 2017

- 1 | Revise the corporate structure, paying special attention to legacy Talisman and complying with OECD and EU standards.
- 2 | Create the "Responsible Tax Policy" section on the Repsol website. Publish an annual tax contribution report for the Group. Be rated as a "transparent" or "responsible" company by Oxfam, ORSC\*, and the FCyT\*
- 3 | Submit a voluntary transparency report to the AEAT (Spanish Tax Agency). Volunteer to participate in the OECD's pilot program to promote cooperative relationships with the tax authorities (ICAP\*). Reach agreements on disputed points with the tax authorities.

\* ORSC: Corporate Social Responsibility Observatory; FCYT: Foundation for Commitment and Transparency; ICAP: International Compliance Assurance Program



**Ethics and  
transparency**

**Fiscal  
Responsibility**

# Global Sustainability Plan



REPSOL

## Our ambition

Zero incidents with local communities as a result of Repsol's operations.

## 2020 Objectives

- 1 Ensure that all assets with the highest criticality [critical or significant risk] plan the management of the social risks and impacts and their contribution to local socioeconomic development.
- 2 Ensure that all assets with the highest criticality [critical or significant risk] have implemented effective grievance mechanisms.

## Lines of action 2017

- 1 Establish the social baseline in the assets of critical-level countries\*  
*Included in the Company's 2017 Sustainability objectives*
- 2 Consolidation of the network of Community Relations professionals.
  - Identify, value, and develop capabilities
  - Facilitate communication and transmission of knowledge and experience
- 3 Ensure the roll-out of the Community Relations and Human Rights framework (norms, processes, training)



# People

## Respect for Human Rights

# Global Sustainability Plan



REPSOL

## Our ambition

| Guarantee people's security with full respect for human rights.

## 2020 Objectives

- 1** | Reach the highest level of best practices according to the Voluntary Principles on Security and Human Rights (VPSHR)\*, taking companies from the sector as a reference. The assessment will be performed with the IGT (Implementation Guidance Tool) available on the VPSHR website.
- 2** | Carry out all the actions defined in the VPSHR Implementation Plan in countries identified as priority. The Plan was created to cover the gaps between the initial situation and the level of practical improvements.

## Lines of action 2017

- 1** | Carry out risk analysis of security and human rights in the five highest priority countries. Identify the most relevant stakeholders in this area.



# People

## Security and Human Rights

\* VPSHR: Multi-actor initiative involving governments, companies, and NGOs that promotes the implementation of a series of guiding principles for hydrocarbon and mining companies to provide security in their operations in a way that is respectful of human rights.

# Global Sustainability Plan

## Our ambition

Make a commitment to people to drive their development and that of their social context.

Guarantee equal opportunities as an element that sets us apart as an integrated, diverse, and inclusive company.

## 2020 Objectives

- 1 | Increase the proportion of women in leadership positions to 30%.
- 2 | Exceed legal obligations in relation to the direct integration of people with disabilities into our workforce in countries where this applies.
- 3 | Improve employee satisfaction rate regarding access to flexibility and work-life balance programs in the climate survey to 70% positive responses.

## Lines of action 2017

- 1 | Relaunch of the Diversity and Work-Life Balance Committee.
- 2 | Evaluate whether gender diversity can be found throughout Repsol's value chain and design an improvement action plan that incorporates gender diversity and inclusive leadership in the Company's strategy.
- 3 | Establish a global diversity map in the Company.
- 4 | Foster the integration of people with disabilities into our workforce: Adding Energy internship program and participation in international networks.
- 5 | Promote tools that facilitate work-life balance. Review work-life balance minimums worldwide.



REPSOL



## People

Diversity, work-life balance and talent retention

# Global Sustainability Plan

## Our ambition

| Zero accidents

## 2020 Objectives

- 1 | Position ourselves as industry leaders (first quartile of sectorial comparisons) in terms of personal and process accident rates.

## Lines of action 2017

- 1 | Revise and update the SE regulatory framework.
- 2 | Comply with the preemptive safety program called SMART Keys\* to prevent major industrial incidents. *Included in the Company's 2017 Sustainability objectives.*
- 3 | Improve critical processes by revising incident management and lessons learned.



REPSOL



# Safe operation

# Risk and incident management

\* Program developed for E&P, Refining, Refining Peru, Chemicals and LPG.

# Global Sustainability Plan

## Our ambition

| Neutral environmental impact of resource management.

## 2020 Objectives

- 1** | Implement Circular Economy projects that will have a positive impact on both society and the Company in all the Business Units.
- 2** | Comply with the path toward the reduction of waste generated and the amount of waste sent to landfill sites, with incremental improvements each year in the ratio that is sent to landfill sites in all the Business Units.
- 3** | Develop water action plans for Refining, Chemicals, and E&P that ensure the excellent management of water resources: minimize harvesting and the impact upon discharge and maximize recirculation.

## Lines of action 2017

- 1** | Define and implement the actions included in the 2017 Water Plan for the Refining, Chemicals, and E&P Businesses.
- 2** | Generate the Circular Economy Initiatives catalog and implement circular projects.
- 3** | Define and implement the 2017 Waste Working Plan for E&P, Refining, Chemicals, LASP, Refining Peru, and Service Stations.



## Resource and impact management



# Global Sustainability Plan



REPSOL

## Our ambition

Position ourselves in a scenario compatible with the Paris Agreement [2°C scenario]

## 2020 Objectives

- 1 Reduce CO<sub>2</sub> eq emissions by 1.9 Mt (2014-2020). Implement the CCAC\* methane emissions mitigation plan. *Included in the Company's 2017 Sustainability objectives*

## Lines of action 2017

- 1 Develop methane and flare gas inventories in accordance with the CCAC and ZRF2030 initiatives, respectively\*.
- 2 Implement the 2017 Carbon and Energy Plan: Reduce CO<sub>2</sub> emissions in the company by 126,000 metric tons, verifiable under ISO 14064, and define the emission reduction opportunities catalog in E&P (North America, Bolivia, Ecuador, and Malaysia).



# Climate change

\* CCAC: Climate & Clean Air Coalition – O&G Methane Partnership, UN Environment ZRF2030: Zero Routine Flaring by 2030, World Bank

# Global Sustainability Plan



## Our ambition

Drive technological innovation as a lever of transformation towards more sustainable business models.

## 2020 Objectives

- 1 | In process of being defined

## Lines of action 2017

- 1 | Analyze the technology and venture capital project portfolio and construct a cross-company sustainability project portfolio based on the following key aspects defined in the Sustainability Model: climate change, resource and impact management, and safe operation.
- 2 | Define monitoring metrics and propose long-term objectives



## Innovation and technology



# Thank you

November 13th, 2017



# Duvernay Development: A Socially Sustainable Approach

**Repsol's 4<sup>th</sup> Annual Sustainability Day**  
London, November 13, 2017

- 1. Unconventional Development**
- 2. Duvernay: Industry Activity and Repsol's Position**
- 3. Stakeholders**
- 4. How We Work: Integrated Model**
- 5. Realizing Social Acceptability: Principles**
- 6. Social Risk Issues**
  - Water
  - Induced Seismicity
  - Emissions
- 7. Conclusions**

# Unconventional Development

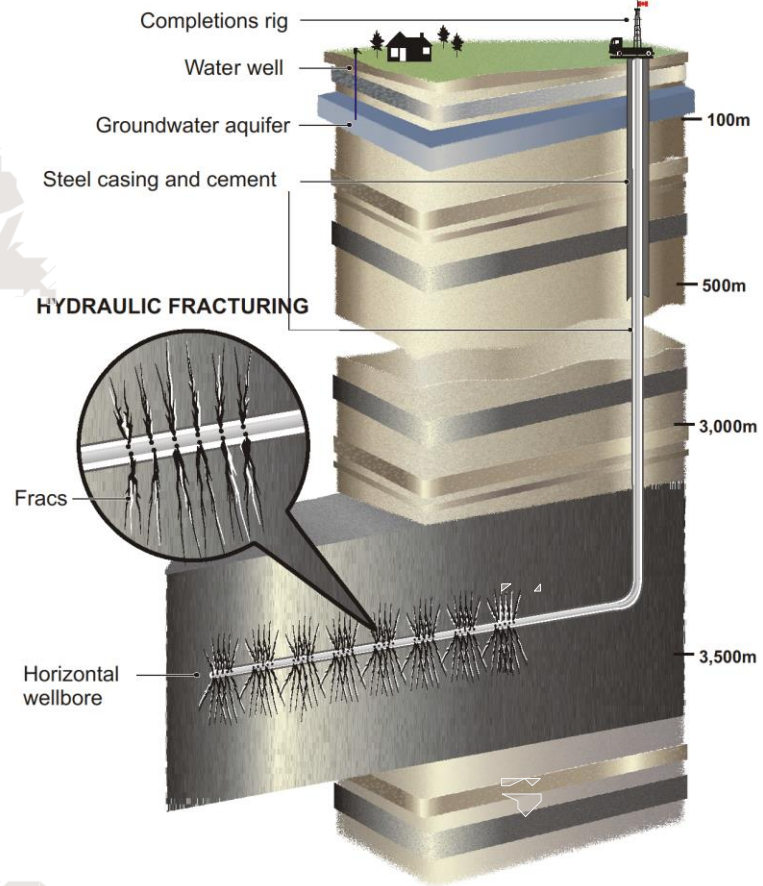
North America Context



✓ **Unconventional Reserves:** tight rock formations like shale, carbonate, and low permeability sandstone, made economic with innovation in long horizontal wells and multi-stage fracture stimulation.



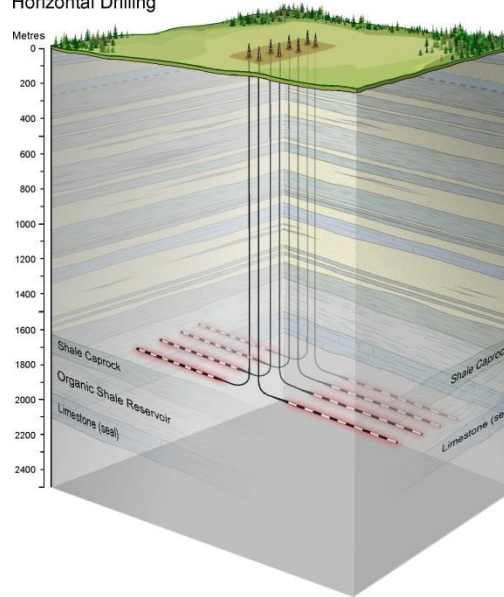
# Unconventional Completions



# Unconventional Development

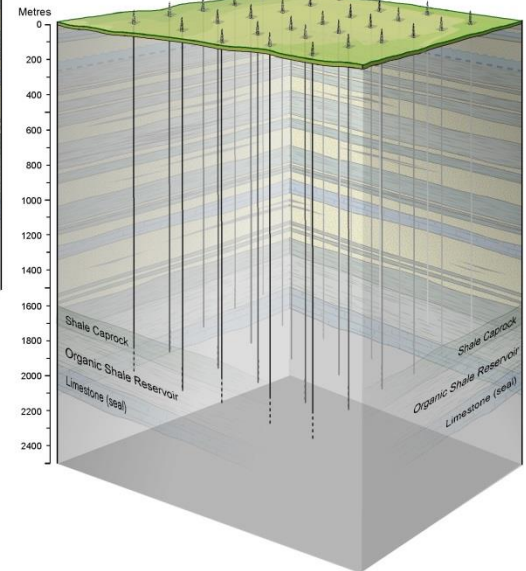
## Environmental Footprint

Horizontal Drilling



Surface Footprint

Vertical Drilling





# Unconventional Development

*Environmental Footprint*



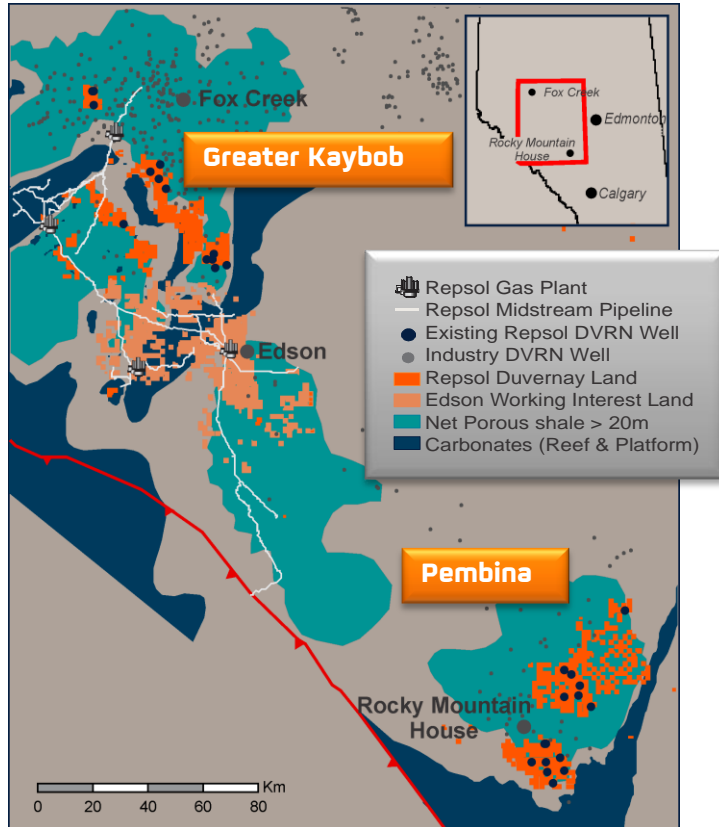
*Completions*



*Producing site*

# Duvernay: Industry Activity

## Repsol's Position



- One of the top tier shale plays in North America
  - ~ 258 TCF + 6 Billion barrels recoverable
- Extends over 400 km across West-Central Alberta
- 679 wells (~600 HZ) drilled to date
- 2016 Total Duvernay production: ~57,000 boe/d

### **Repsol: Among the top five acreage holders**

- Large contiguous land position with a significant recoverable prospective resource
- Competitive Advantage
  - Infrastructure
  - Flexibility
  - Financial Strength
- 2016 Production: 17.3 mmcfe/d (3.1 mboe/d)

# Great Predictable Rocks

## Five Key Attributes of a Good Shale Play



- Duvernay Has Them All
  - Sufficient Rock Volume [>20M Net Pay]
  - Brittleness [Low Clay]
  - Predictable Depth & Structure
  - High Pressure [>2,500M, >0.5psi/ft]
  - TOC & Maturity [2%]
- The Duvernay is one of the few plays in North America, along with the Eagle Ford and Bakken which pass all these requirements.
- The Duvernay is top ranking in respect to:
  - Pressure, Low Sw and Yield Potential.

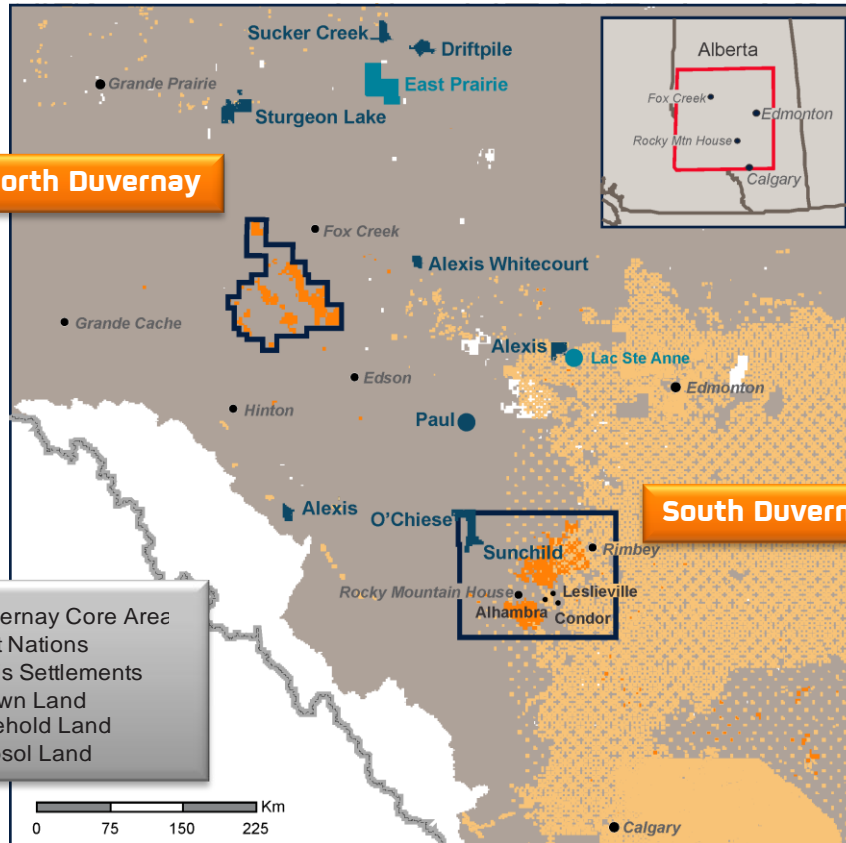
# Attributes



Attribute	Duvernay	Eagle Ford	BC Montney	Marcellus
Depth (m)	2900-4300	2000-4300	1650-3350	1300-2500
Thickness (m)	20-70	10-70	200-350	30-90
Gradient (psi/ft)	0.65-0.95	0.55-1.0	0.45-0.9	0.3-0.78
Liquid Yield (bbl/mmcft)	up to 1000+	up to 600	up to 70	up to 50
Producing Phase Windows	dry gas to oil	dry gas to oil	dry to wet gas	dry to wet gas
*Avg Porosity [%]	5.4 <sub>[680]</sub>	8.6 <sub>[1515]</sub>	4.3 <sub>[391]</sub>	6.7 <sub>[979]</sub>
*Avg TOC [wt %]	3.0 <sub>[1551]</sub>	3.6 <sub>[2168]</sub>	1.9 <sub>[872]</sub>	4.8 <sub>[1515]</sub>
*Avg Sw [%]	18.0 <sub>[672]</sub>	31.5 <sub>[1469]</sub>	20.8 <sub>[291]</sub>	42.7 <sub>[965]</sub>
*Total Brittle [Qtz+Carb]	64.1 <sub>[703]</sub>	75.9 <sub>[2059]</sub>	65.3 <sub>[750]</sub>	49.1 <sub>[1398]</sub>
*Total Ductile [Clay]	23.0 <sub>[703]</sub>	14.1 <sub>[2059]</sub>	12.9 <sub>[750]</sub>	35.6 <sub>[1398]</sub>

\* Repsol averages from cored samples [#: number of samples analyzed]

# Duvernay Stakeholders



## First Nations

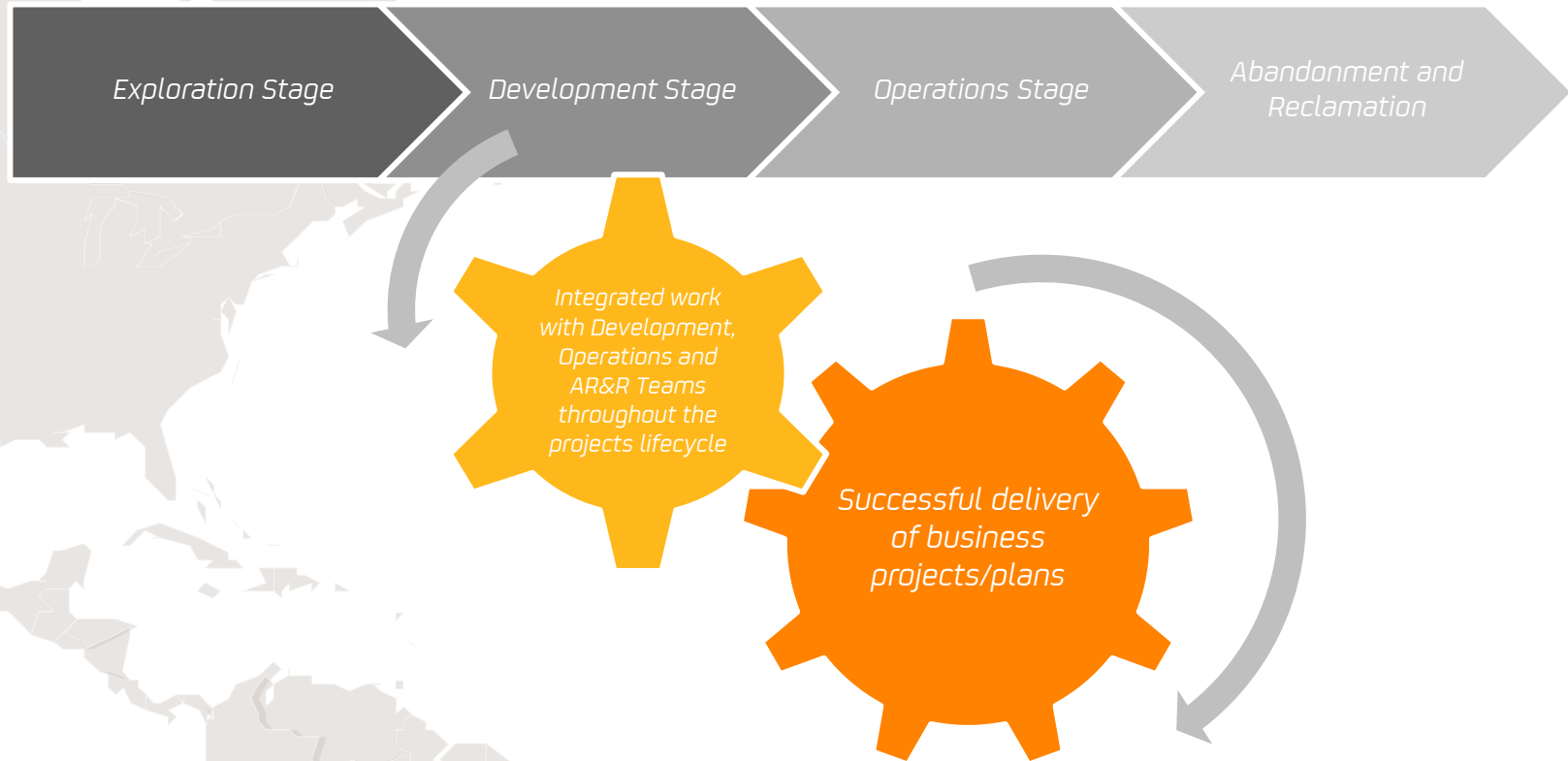
- Alexis Nakota Sioux Nation
- Paul First Nation
- O'Chiese First Nation
- Sunchild First Nation
- Sturgeon Lake First Nation
- Sucker Creek Nation
- Driftpile Cree Nation

## Metis

- East Prairie Metis (Settlement)
- Lac Ste. Anne (Non-Settlement)

# How We Work

*Integrated Model*



# Realizing Social Acceptability

## Our Principles



1

### **Responsible Development**

- Environmentally and socially responsible operations.
- Minimizing, managing impacts of our operations

2

### **Relationships**

- Building relationships with stakeholders based on openness, trust and respect

3

### **Two-Way Dialogue**

- Early and meaningful dialogue with local communities to explain our operations and address concerns

4

### **Community Benefits and Capacity Building**

- Ensure local communities benefit from our activities
- Contributing to the sustainable economic and social development of the communities where we operate

# Responsible Development

## Principle 1



- Maintaining the privilege of working and living in local communities is critical for Repsol's project execution and stakeholder reputation
- Commitments to managing the impacts of our activities (dust, noise, traffic, lease maintenance issues and water management)
- The GNP is field-driven and field-owned
  - Reps from different areas of the business developed initial commitments; program is constantly being evaluated/improved
- Toll-free phone numbers available to allow community members voice their concerns and questions

# Relationships

## Principle 2



2

## **Case Study - Freehold Land**

*[Rocky Mountain House area – South Duvernay]*

### **Concerns on Ferrier 10-4-39-6 WSM Pad Site**

- Numerous residents in close proximity to pad site.
- Area residents expressed concerns regarding noise during drilling and completions operations.
- A noise assessment was completed.
- A 30-40 foot wall was erected around large portions of the lease.
- Smaller walls were also built around specific equipment on lease.
- Area residents were extremely satisfied with the measures taken.
- The AER has used this specific location/example in presentations as a positive pro-active practice to combat noise in populated areas.



# Two-Way Dialogue

## Principle 3



3

## ***Case Study- First Nation (FN) Community Concerns on proposed compressor site***

- In a site visit conducted to the site, the FN reps had an opportunity to assess the proposed project area.
- Community reps typically assess the plants species within the project area and also search for cultural sites.
- FN monitors and elders identified a traditional campsite which likely was an old Trapper cabin and also found traditional gravesites.
- FN notified Alberta Culture and Tourism.
- The community requested for this site to be protected and avoided.
- Repsol agreed to move the compressor to a new location and maintain a minimum 120m buffer from the site.

# Community Benefits and Capacity Building

## Principle 4

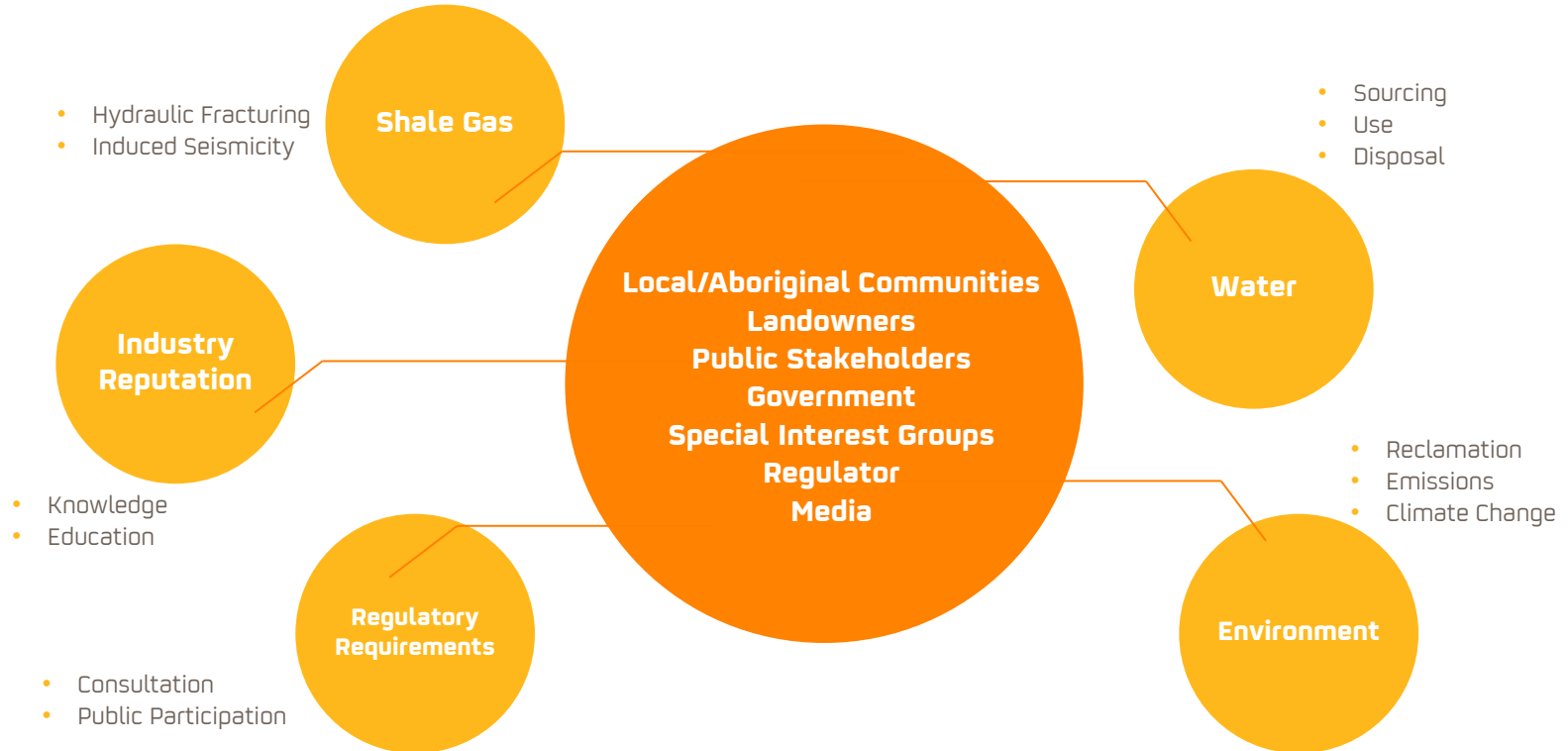


4

- The Canadian **Social Investment (SI)** Program is a strategic tool, catered to support the needs of the individual communities in which we operate.
  - Focus areas: environment, education and empowering communities
    - 2016 CI: **\$2.8** million to support community needs across the company's Canadian operations.
- 
- The **Local Economic Engagement Strategy (LEES)** works to incorporate local businesses into Repsol activities, taking safety, competitiveness, competencies and reliability into account
  - Repsol invests in capacity building initiatives and supports government programs in this area.
  - Repsol reports on its local spend annually.
    - 2016 local spend: **\$61.4** million

# Duvernay Social Risk Issues

*Complex and Multi-faceted*



# Full Life Cycle Environmental Management



*Well Site in  
Greater Edson,  
Alberta*

*Post-reclamation*

*Pre-reclamation*





# Water





# Induced Seismicity (IS)





# Emissions

## Context

Voluntary Global Climate Change initiatives

Evolving regulations: Alberta Climate Leadership Plan and Act; Canada's Pan-Canadian Framework

45% reduction of methane emissions by 2025

## Repsol's Approach

GHG reductions in all countries

Focus on energy efficiency, use of clean fuels and flaring reductions

Key role of natural gas in the global energy mix

## CBU Strategy

GHG reductions in our operations

Venting and fuel reduction opportunities

Changes of equipment and design standards

Multiyear cost-effective strategy

Fugitive emissions management

## Collaboration

Work with industry, government and academia on technological innovation towards a more sustainable energy future

# Conclusions

- Common practice is to focus on environmental aspects of sustainability
- Ensuring our business is socially sustainable is equally important:
  - Basic human needs are met
  - Equity exists amongst all parties
  - Human potential is supported
  - Cultural heritage is preserved
  - Benefits from our work are identified and provided
  - Impacts from our operations are identified and mitigated

*How we work in the Duvernay now lays the right foundation for long-term relationships with stakeholders.*

- ✓ *Social sustainability supports business growth*





# Duvernay Development: A Socially Sustainable Approach

**Repsol's 4<sup>th</sup> Annual Sustainability Day**  
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# Increasing our business resilience in 2018 and beyond

**Repsol, Sustainability Day**

November 2017



# Index

*Increasing our business resilience in 2018 and beyond*



**CARBON PRICING: AN EFFECTIVE TOOL TO IMPROVE OUR RESILIENCE**

**ENERGY EFFICIENCY: THE CORNERSTONE TO ACHIEVE THE LOW EMISSION PATHWAY**

**OUR EXPERIENCE ISSUING A GREEN BOND**

# Our position on Climate Change

*How will we prepare our company for a low emissions future?*



- **In Repsol we believe that two global goals have to be pursued:**
  - ✓ *To fight against climate change and*
  - ✓ *To provide access to affordable energy in order to support economic growth and development*
- **We set up and deploy ambitious energy efficiency programs to reduce energy consumption and GHG emissions as one of the key elements of our strategy.** These programs pursue long term targets which have been made public in order to facilitate their progress by the stakeholders.
- **We consider natural gas as the most cost effective solution to promote a structured transition to a low emissions future, specifically in the power generations field.** In this sense, our upstream portfolio evolves towards greater percentage of gas versus oil [about 65% in production and 75% in reserves].
- We are convinced that **innovation and technological development** are essential for ensuring reliable and sustainable energy supply in the long term.
- **Carbon Capture, Utilization and Storage** is a key element to hold the increase in the global average temperature well below 2°C above pre-industrial levels. **Repsol supports the deployment of these technologies**, working to allow projects to be technically and economically feasible, sustainable and socially acceptable.

# Carbon Pricing

*An effective tool to improve our resilience*



- **Repsol supports worldwide carbon pricing policies as a global policy framework that will provide our businesses with a clear roadmap for low emissions future investments.**
- In any carbon pricing scheme or climate policy implemented by governments **industry competitiveness** has to be a central piece.
- Carbon price will **ensure the resilience of our portfolio**, encouraging energy efficiency and low emission technologies

*10 \$/t will be used in 2018.*

*This value will reach 40 \$/t by 2025.*

- ✓ In 2016 around 70% of the global emissions under a Carbon Pricing scheme were lower than 10 USD/t.
- ✓ In addition, that value covers all the current ETS schemes in force.
- ✓ Where an external carbon scheme is already in force the most restrictive value is chosen.



*Paying for Carbon Coalition (PfCC)*

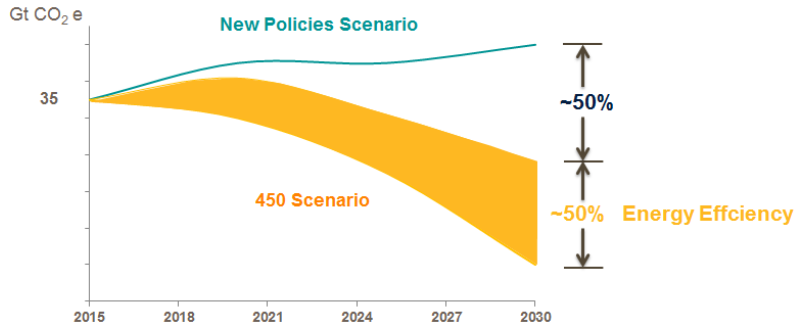
# Energy Efficiency

The cornerstone to achieve the low emission pathways

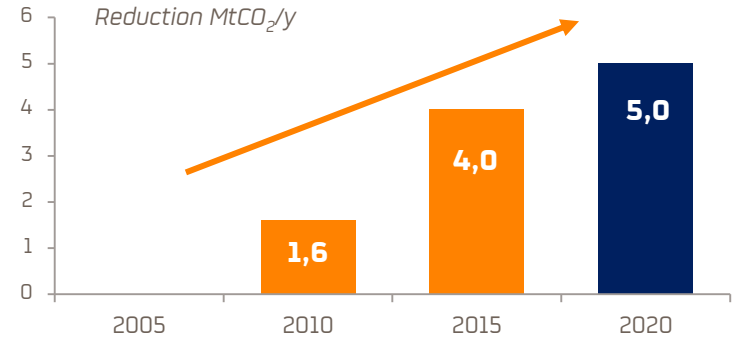


Energy efficiency is and will be key in a low emissions future

Repsol has a long history...  
...with ambitious and challenging future targets



Source: IEA, WEO 2015



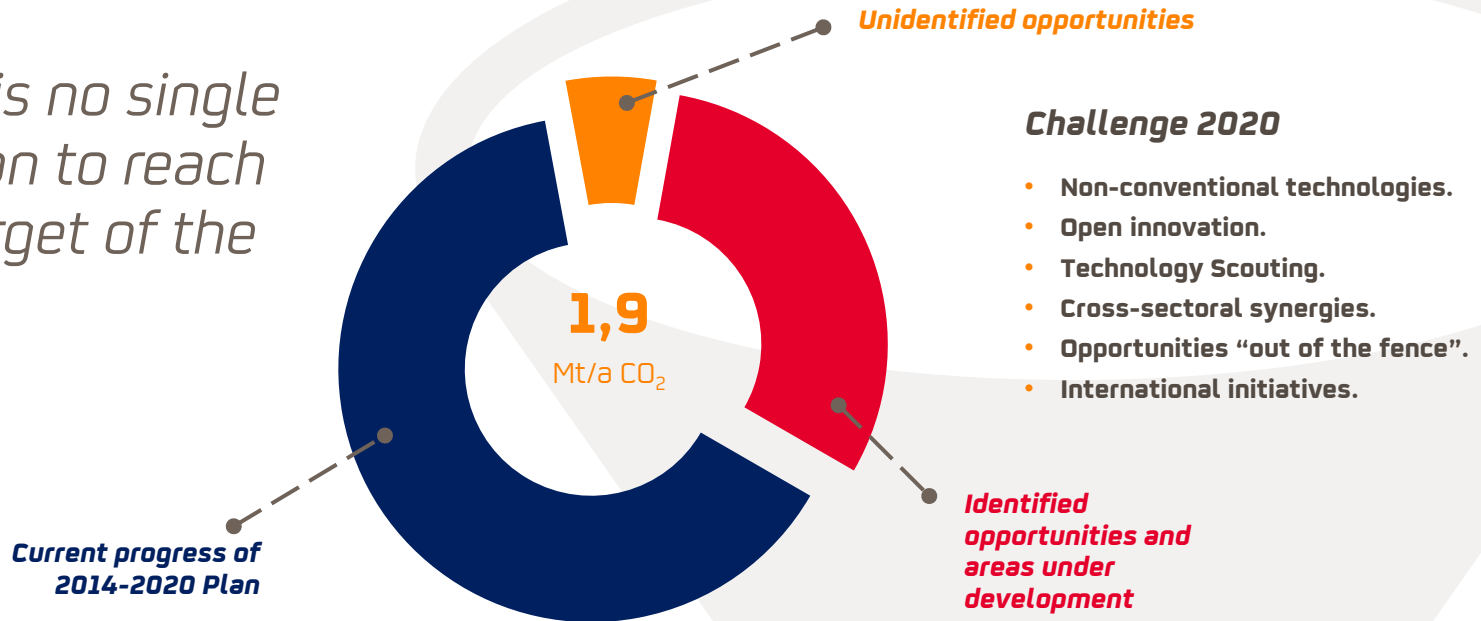
The 2005-2013 Carbon Plan reached a reduction of 3.1 Mt CO<sub>2</sub>.  
The new 2014-2020 Energy and Carbon Plan has an additional reduction target of 1.9 Mt CO<sub>2</sub>.

# Energy Efficiency

*The cornerstone to achieve the low emission pathways*



*There is no single solution to reach the target of the Plan*



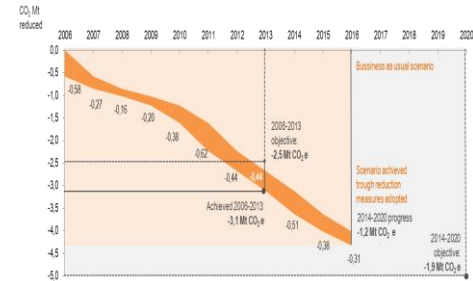
# Energy Efficiency

*The cornerstone to achieve the low emission pathways*



Progress

- ✓ Repsol continues implementing a **global energy management system** (EnMS) under ISO 50001 standard.
- ✓ About **15 energy audits and 150 efficiency actions** are carried out every year.
- ✓ **Around 500 M€ of investments** planned in GHG emissions reductions and energy efficiency measures by 2020.
- ✓ Numerous **R&D projects** are in development
- ✓ Repsol has endorsed the **Climate and Clean Air Coalition initiative – O&G Methane Partnership** promoted by UN Environment.
- ✓ The company has also endorsed **World bank Zero Routine Flaring by 2030 initiative**.
- ✓ Repsol joined **OGCI (Oil & Gas Climate Initiative)** in June 2015.
- ✓ In November 2016, the initiative launched the **OGCI Climate Investments**. It has been set up to invest **one billion dollars** over the next decade to accelerate the development of innovative technologies that, once commercialized, have the potential to reduce GHG emissions on a significant scale.





# Energy Efficiency

*The cornerstone to achieve the low emission pathways*



1



**Knowledge management**

2



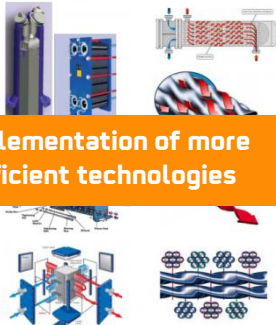
**Energy management KPI's**

3

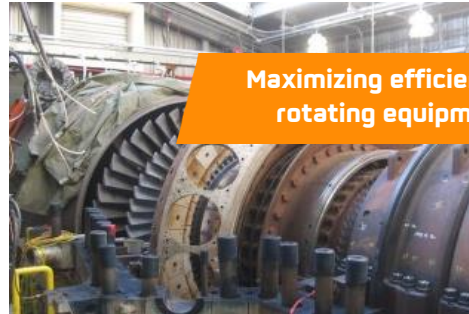


**New developments of high efficiency internal devices**

4



**Implementation of more efficient technologies**



**Maximizing efficiency of rotating equipment**

5



**Optimization of fractionation schemes**

6

# Energy Efficiency

*Some examples*



## *Replacement of FCC unit steam turbine driven compressors by electric motor with mechanical speed regulation*

- Main air blower (F3-C1) and Wet Gas Compressor (F3-C2) in the Fluid Catalytic Cracking unit were powered by condensation turbines (Consumption = 60 t/h medium pressure steam).
- Modifications:
  - Replacement of the turbines by electric motor with variable speed control systems.
  - Replacing the current compressor with a more efficient one.
- Improvement reached:
  - Reduction of steam consumption and improvement of operational flexibility by optimizing the equipment according to the demand of the process.



<b>Location</b>	Muskiz - Spain
<b>Typology</b>	Upgrade of equipment: Dynamic Equipment
<b>Date of Start</b>	2017
<b>CO<sub>2</sub> reduction</b>	43,000 t CO <sub>2</sub> /y

# Energy Efficiency

*Some examples*



## *Air preheater redesign in Crude and Vacuum furnaces units*

- Flue gas temperature from furnaces 611-F1 and 612-F1 was around 200-250 °C with an overall efficiency about 87,3%.
- Air preheater redesign allows to reduce the exit temperature of exhausted gases up to values of 160°C, increasing the operating efficiency up to 91%.



**Location**

Cartagena - Spain

**Typology**

Upgrade of equipment: Heat

**Date of Start**

2016

**CO<sub>2</sub> reduction**

9,000 t CO<sub>2</sub>/y

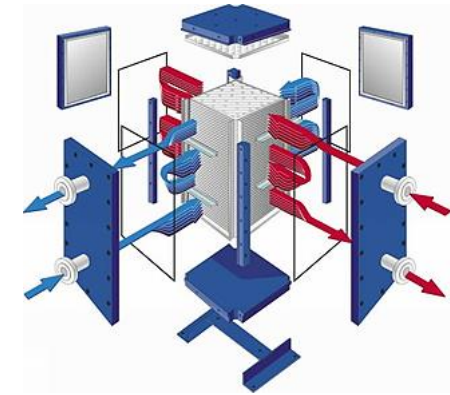
# Energy Efficiency

Some examples



## Replacement of four Shell & Tube conventional heat exchangers by a Compabloc<sup>®</sup> Heat Exchanger

- The crude preheating train recovers process heat from the different process streams to save gas in the CDU fired heater. Over time, its efficiency is affected by fouling.
- Modifications:
  - Replacement of E011A/D S&T heat exchangers with a plate heat exchanger designed for the specific operating conditions and crude processed in the unit.
- Improvement reached:
  - Reduction of fouling and improvement of the heat transfer efficiency which means less fuel fired in the heater and less CO<sub>2</sub> emissions while keeping the unit throughput.



<b>Location</b>	Cartagena - Spain
<b>Typology</b>	Upgrade of equipment: Heat
<b>Date of Start</b>	2017
<b>CO<sub>2</sub> reduction</b>	8,400 t CO <sub>2</sub> /y

# Energy Efficiency

Some examples



## repHEN: Boosting energy efficiency in refineries preheat trains

- repHEN (Repsol Heat Exchanger Network) is an easy-to-use monitoring tool used to select the best cleaning schedule for heat exchangers, where fouling reduced efficiency and consequently increased furnace fuel consumption significantly.
- repHEN helps identify the most critical heat exchangers in terms of fouling and therefore optimizes energy efficiency by:
  - Defining the best cleaning strategy, both in a scheduled base or during an opportunity shutdown.
  - Analyzing possible investments to enable online cleaning.
  - Identifying opportunities to retrofit designs to increase velocities that may reduce fouling .



<b>Location</b>	All refineries - Repsol
<b>Typology</b>	Energy integration
<b>Date of Start</b>	2014
<b>CO<sub>2</sub> reduction</b>	Reduce CO <sub>2</sub> emissions in the main refinery units by 3-10%

# Energy Efficiency & Green Bond

## Categories and technical typologies



### Category 1 Energy Efficiency

- **Upgrade of process equipment: Heat**  
Our facilities consume large amounts of energy and this energy is produced in heat transfer equipment such as boilers, furnaces, etc. Their operation and improvement is a key issue in order to improve our energy performance.
- **Upgrade of equipment: Dynamic equipment**  
Fluids are moved using dynamic equipment such as pumps, compressors, etc. They need a significant amount of energy to work.
- **Improvement of operating criteria**  
The way facilities are operated is key in order to reduce energy consumption.
- **Energy integration**  
A cross linked grid with hot and cold streams are working on the facilities. Taking advantage of the opportunity to integrate heat cold streams with hot streams is a key optimization vector in our industrial complexes.
- **New units / process scheme modification**  
Sometimes major modifications are needed in order to update old process units. These new units are more efficient than previous one.
- **Network optimization**  
Networks have to be operated in optimal conditions avoiding leaks, unnecessary distances, improve equipment and pipes isolation, etc.

### Category 2 Low Emissions Technologies

This category includes other GHG emissions reduction projects no related to energy efficiency one. Precisely, the technologies included will be limited exclusively to the following topics:

- ✓ Methane emissions mitigation (associated with our gas production plants and gas pipelines).
- ✓ Reduction of flaring and venting.
- ✓ Alternative power generation.

# Our experience issuing a Green Bond

## Objective and eligible projects



- Repsol's Green Bond objective is to **avoid GHG emissions** through the implementation of energy efficiency and low emissions technology investments.
- Repsol Green Bond Framework of eligible projects, defined for its first sustainable issuance, includes **finance and/or refinance projects**. The financial investments will be made between 2017 and 2022.
- According to the commitment to energy efficiency and fighting against climate change, Repsol has an **ongoing** plan with the objective of **reducing 1.9 million tons of GHG emissions annual run rate by 2020** (starting in 2014) which will be included at the framework of the eligible projects.
- Currently, there have been identified **320 eligible projects** at the Refining and Chemicals businesses, which accomplish the objective pursued and reach a volume of investment over **EUR 540 millions**.
- The eligible projects are disclosed at the following table:

	M€	Nº of Projects	Mt CO <sub>2</sub> eq
<b>Green Bond</b>	540	320	1.3
<b>Refinancing projects</b>	274	184	0.8
<b>Financing projects</b>	266	136	0.5

- In case of divestment or cancellation of a project, Repsol will use the net proceeds to finance other eligible projects which are compliant with the Green Bond framework.
- Repsol will be committed to **report on an annual basis** the proceeds allocation in respect of the eligible projects and the GHG emissions avoided arising from these eligible projects for each category on an aggregate basis by technical typologies, and activity.

# Our experience issuing a Green Bond

## Green Bond Principles Compliance



*Repsol Green Bond Framework has been developed with the aim of providing transparency, disclosure, integrity and clarity to investors, and follow the ICMA's Green Bond Principles.*

Use of Proceeds



Proceeds of the bond will be allocated to investment projects aimed to decrease GHG emissions by 1.3 million tons of CO<sub>2</sub>eq. The GHG emissions reduction plan includes operating improvement actions with no associated investments. Both contribute to meet the avoidance of 1.9 million tons of GHG emissions annual run rate by 2020. This includes two Eligible Projects categories in our production facilities: energy efficiency projects and low emissions technologies.

Project Evaluation and Selection



Repsol is committed to ensure the responsible management and sustainable value of the financed projects through the integration of ESG criteria, at project level, applying to the whole business divisions of the group, according to its Sustainability Policy. The process of evaluation and selection of projects includes several aspects; from the proposal of the potentially eligible projects by the Technical Management according to profitability and the GHG emissions avoided, to the monitoring at Corporate level by the Sustainability Division, the Executive Steering Committee and the Green Bond Committee.

Management of Proceeds



The use of proceeds should be allocated to the eligible projects selected. An independent third party will verify annually the reporting metrics and the compliance with the Green Bond Principles until the allocation of the net proceeds.

Reporting



Repsol will be committed to disclose a report on an annual basis verified by an external auditor, providing: i) the proceeds allocation in respect of the Eligible Projects ii) GHG emissions avoided arising from these Eligible Projects for each category on an aggregate basis by technical typologies, and activity.

**Vigeo has evaluated Repsol criteria**

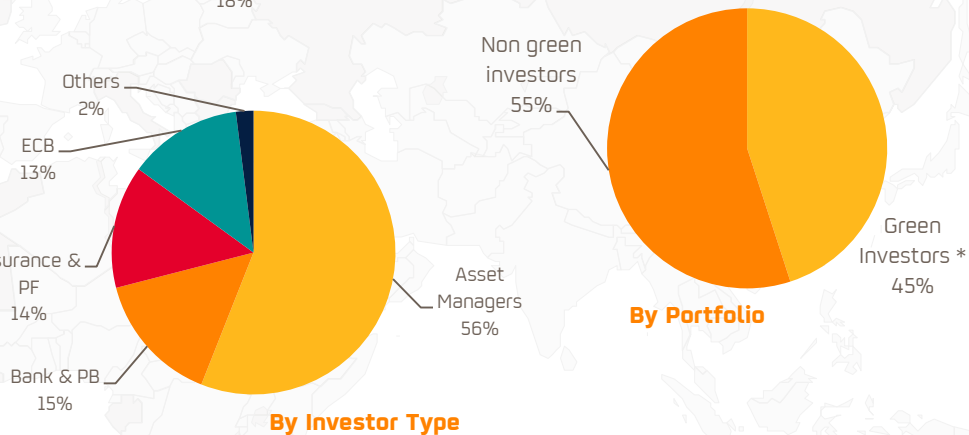
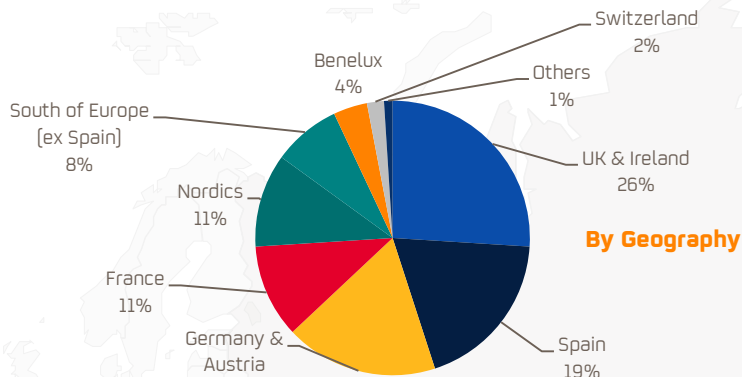


# Our experience issuing a Green Bond

## Term Sheet and Investor Distribution



<b>Issuer:</b>	Repsol International Finance B.V
<b>Guarantor:</b>	Repsol S.A
<b>Ratings:</b>	Baa2 / BBB- /BBB
<b>Format:</b>	Senior, Unsecured, Reg S
<b>Tenor:</b>	5 - year
<b>Issue Size:</b>	€ 500,000,000
<b>Pricing Date:</b>	9th May 2017
<b>Settlement Date:</b>	23rd May 2017
<b>Maturity Date:</b>	23rd May 2022
<b>Mid-swap Yield:</b>	0.238%
<b>Re-offer spread:</b>	MS + 35 bp
<b>Benchmark:</b>	OBL 0% April 2022
<b>Spread vs. Benchmark:</b>	88,5 bp
<b>Re-offer Yield / Price:</b>	0.588% / 99.568
<b>Coupon:</b>	0,5%
<b>Listing &amp; Denoms:</b>	EMTN / 100 k / English Law / Lux List / COC
<b>Covenants:</b>	As per EMTN Programme
<b>Third Party Opinion:</b>	Vigeo



\*Without the participation of the ECB, the percentage of Green Investors would be 51%.

# Our experience issuing a Green Bond

## Lessons Learnt



*Pioneering issuance by a leading Oil & Gas company committed to reducing CO<sub>2</sub> emissions received mixed reactions:*

- While it received a **positive response from** institutional investors:
  - 5x times oversubscribed
  - 45% Sustainable and Responsible investors among initial subscribers
- It was not included in **green bond indices**:
  - the Climate Bonds Initiative (CBI) did not include the bond in its green bond listings as its green bond taxonomy does not currently consider process efficiency projects by Oil & Gas
- **Key challenges going forward:**
  - Our green bond has opened up a debate on the active role Oil & Gas companies can play in the fight against climate change and the role of green bonds to fund their CO<sub>2</sub> reduction projects
  - Market opportunity to meet the potential demand to fund Oil & Gas CO<sub>2</sub> reduction projects and the growing demand by institutional investors seeking suitable green investments



**Thank you**

November 2017



# Repsol, 4<sup>th</sup> Sustainability Day

London, November 13<sup>th</sup>, 2017

