

CLIMATE RISKS AND OPPORTUNITIES FOR THE INVESTORS



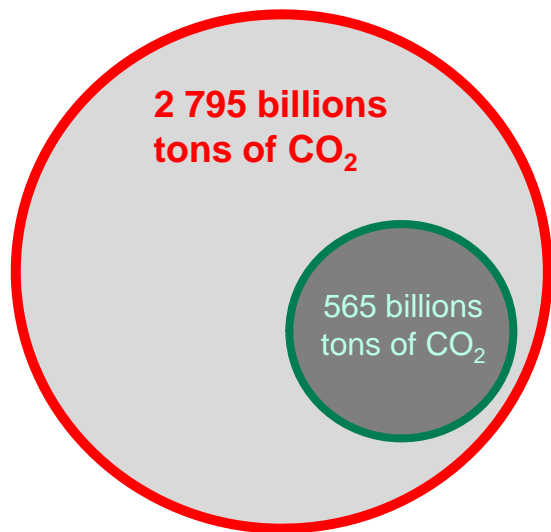
MILANO
09 November 2015



BNP PARIBAS

The bank for a changing world

The «2°C scenario» requires to keep in the ground 80% of known reserves of fossil fuels



Total world carbon reserves

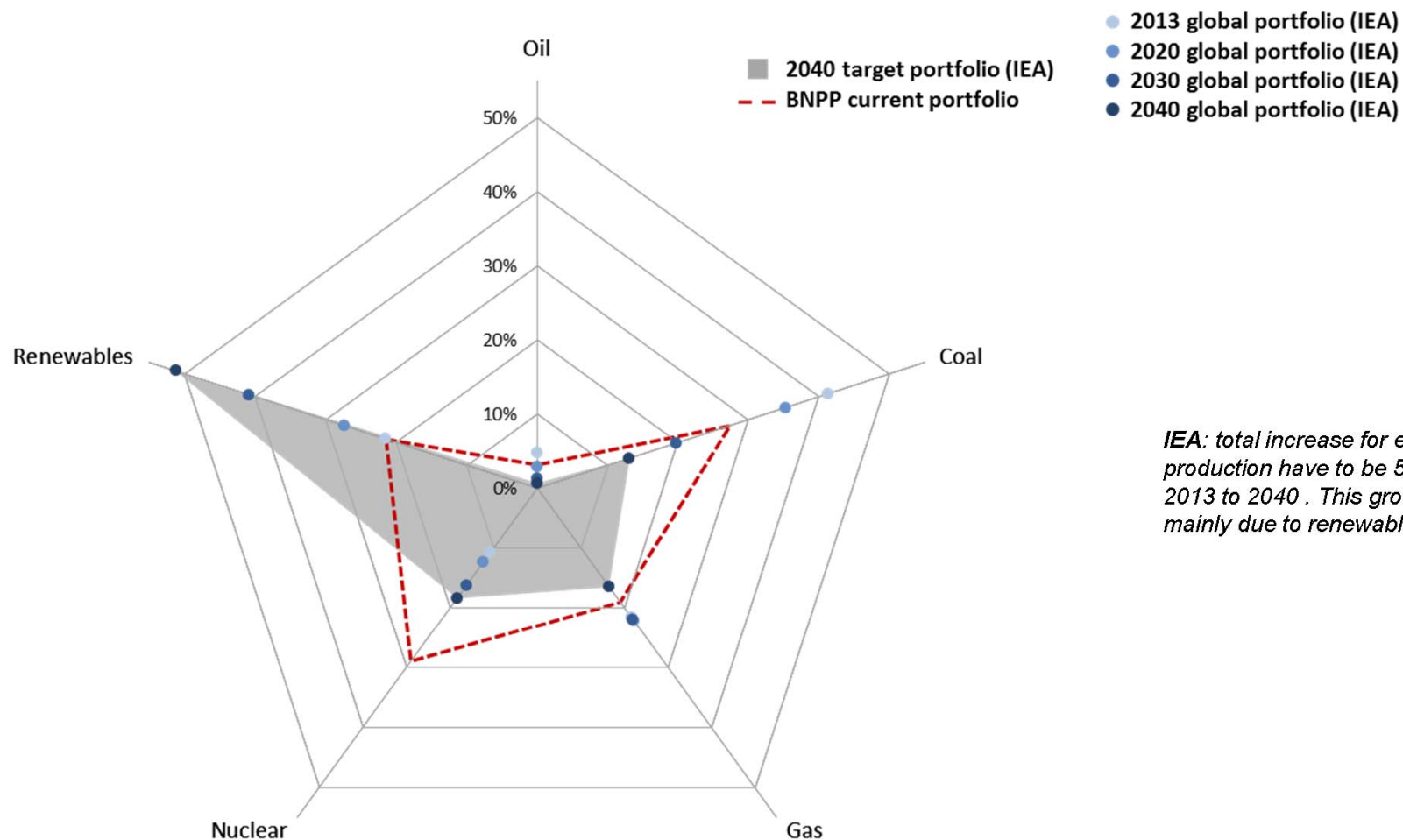
Emissions from burning all known reserves of coal, oil and gas

Remaining carbon budget

This is how much CO₂ can be emitted until 2050 and still give a reasonable change to be in the 2°C scenario



Electricity mix projections in the 2°C scenario from the IEA



IEA: total increase for electricity production have to be 51% from 2013 to 2040 . This growth is mainly due to renewable energies.



Fossil fuel companies bear a significant risk linked to stranded assets

Stranded assets lose value or turn into liabilities before the end of their expected economic life.

As far as fossil fuels are concerned, this means assets that will not be burned (stranded in the ground).

Stranded by climate change regulation: burning available fossil fuels would mean breaching the 2°C globally-agreed temperature goal, regulation to tackle CO₂ would curb fossil fuel use.

- Tax on CO₂
- Regulation on energy efficiency...

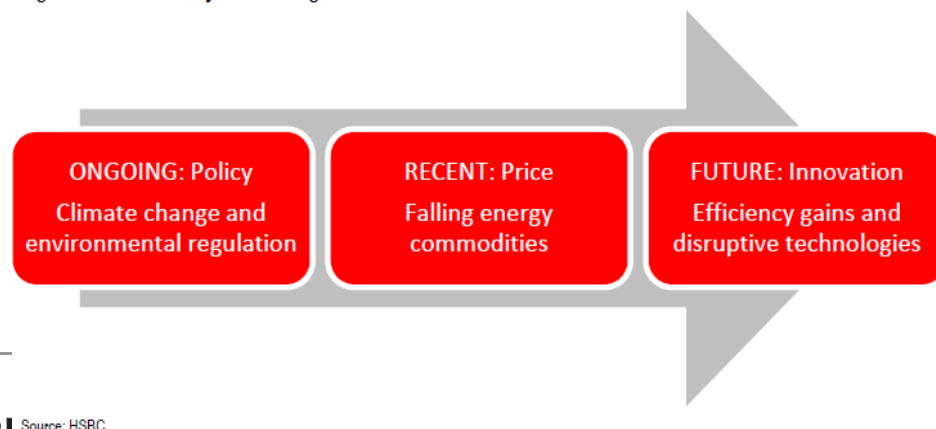
Stranded by economics: oil types such as oil sands and shale oil break even at USD80 per barrel or higher and assets have already become loss-making.

- Market value of oil & gas companies has dropped by over USD 580bn in the last 9 months.

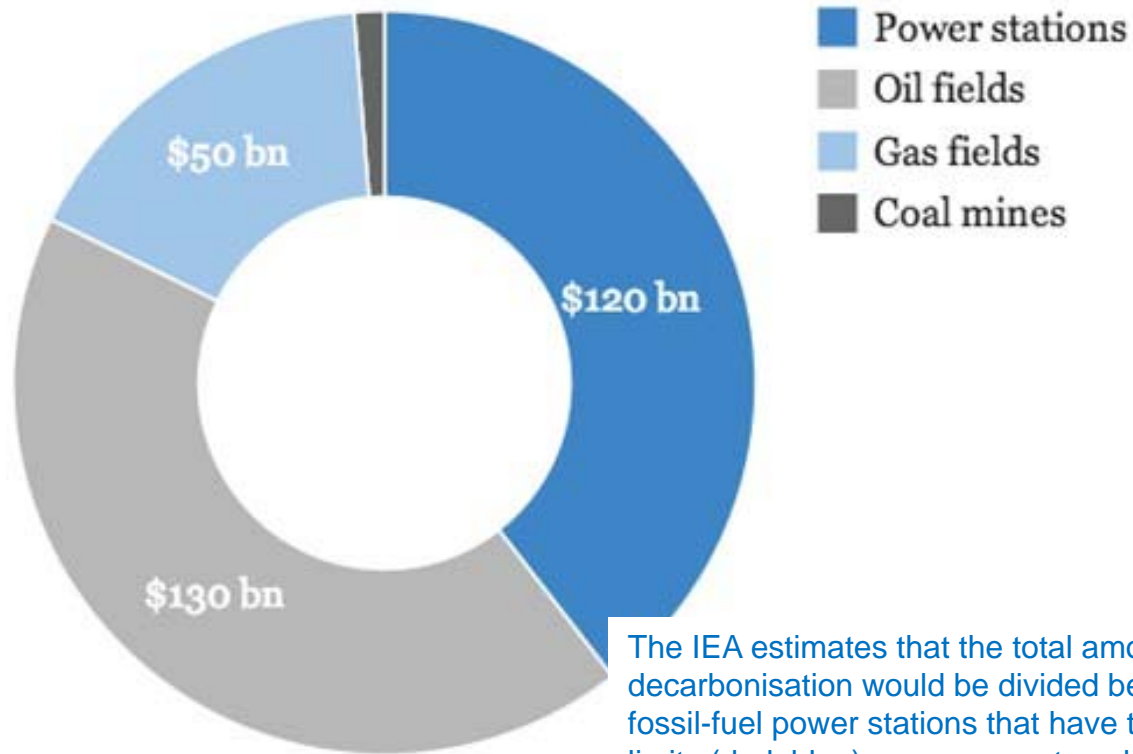
Stranded by energy innovation: business model resilience

- Energy efficiency and advancements in renewables, battery storage and enhanced oil recovery could impact demand for some fossil fuels.
- Corporate with “fossil” business model may not be resilient to innovation

Figure 1: A brief history of stranding



The IEA foresee many stranded assets in the future



The IEA estimates that the total amount stranded by decarbonisation would be divided between money spent on fossil-fuel power stations that have to close due to emissions limits (dark blue), money spent exploring for oil but not paid back because the oil can't be sold (light grey), spending on gas exploration (light blue) and a small amount of lost investment in coal mines (dark grey).

World Energy Outlook 2014



BNP PARIBAS

The bank for a changing world.

Some companies in the coal sector are already rated as highly risky assets on the market with collapsing values.

Coal price divided by two since 2012.
-20% in last 12 months.

15/09/2015: **Glencore**: the company, already the worst performer in the FTSE 100 index in 2015, has lost almost **60%** of its value since the beginning of the year.

Dow Jones Total Market Coal Sector Index: -76%
over the past five years

16/07/2015: Since 2015, values of **Arch, Peabody or Alpha Natural Resources** have collapsed by **30, 40 and 70%**.

Mercer, 8/07/2015: Depending on the climate scenario which plays out, the average annual returns from the coal sub-sector could fall **up to 74%** over the next 35 years, with effects being more pronounced over the coming decade (eroding between 26% and 138% of average annual returns over the next 10 years).

28/08/2015: **Standard & Poor's** assessed 21 mining companies and 15 of them have been rated as speculative obligations – i.e. embedding important risk for investors.

Carbon Tracker: principal energy companies could lose between **40 and 60%** of their stock exchange value if the 2°C target is enforced.
McKinsey forecasts a possible loss of 30 to 40%. **BP, for example, would be unable to burn a quarter of its reserves if the 2°C target was enforced.** There would be a secondary effect too: because of the over-supply of fossil fuels, their price would fall.

30/09/2015: **Rio Tinto** sells its Bengalla mine in Australia to reduce its exposure to coal under pressure from the markets.



The Montreal Carbon Pledge: measure and disclose



PRESS RELEASE

BNP Paribas Investment Partners signs Montreal Carbon Pledge to support investor moves to monitor carbon footprint

22 May 2015

Ahead of COP21, BNP Paribas Investment Partners has become one of the first mainstream investment managers to sign the Montreal Carbon Pledge, launched on 25 September 2014 at *PRI in Person* in Montreal. The Montreal Carbon Pledge commits investors to measuring and publicly disclosing the carbon footprint of their investment portfolios on an annual basis, in accordance with the Portfolio Decarbonization Coalition (PDC). The PDC is a United Nations Environment Programme aimed at supporting asset owners as they work towards reducing their carbon exposure.



Divestment: a few examples

AXA decides to divest from coal sector and tar sands.

THE GUARDIAN launches its campaign “Keep it in the Ground”

Recent SB 185 Californian law requires California Public Employees’ Retirement System (CalPERS) and California State Teachers’ Retirement System (CalSTRS) to divest from any mining company whose turnover relies on coal mining for more than 50%.

PDC Portfolio Decarbonization Coalition a multi-stakeholder initiative of institutional investors committed to gradually decarbonizing their portfolios. September 2014 and COP21 the goal is to assemble a coalition of investors who in aggregate will commit to decarbonizing at least USD 100bn in institutional investment across asset classes. PDC membership at \$62bn AUM and growing;

2014: Rockefeller Brothers Fund decides to divest from coal sector and tar sands.

350.ORG First divestment campaign worldwide

NORWAY sovereign fund decides to divest from coal sector



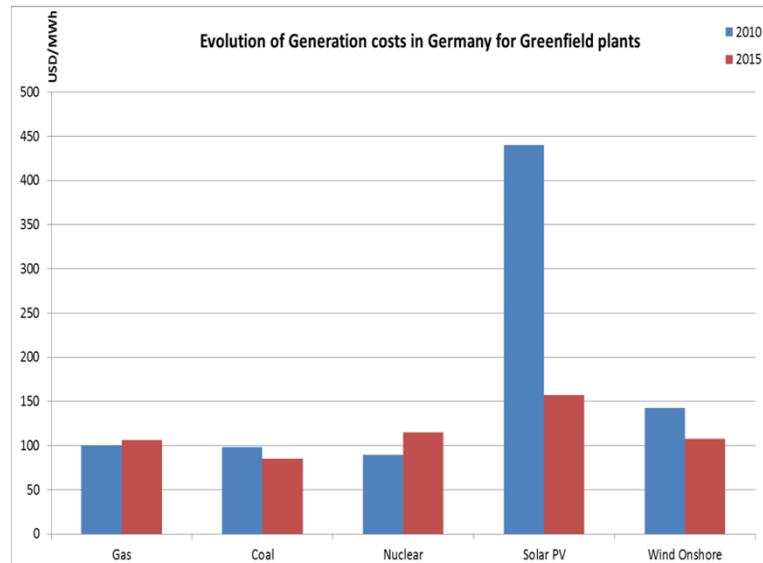
List of signatories of the PDC (\$62bn AUM so far)

Australian Ethical
Church of Sweden
Environment Agency Pension Fund
Fonds de réserves pour les retraites (FRR)
KLP
Local Government Super
Le Régime de Retraite additionnelle de la
Fonction publique (ERAFP)
Storebrand
The University of Sydney
Toronto Atmospheric Fund
A Capital
Amundi Asset Management
Inflection Point Capital Management
Mandatum Life
Mirova
RobecoSAM



Renewables: profitability rises and public support becomes more stable

Wind and solar subsidies decline as costs fall

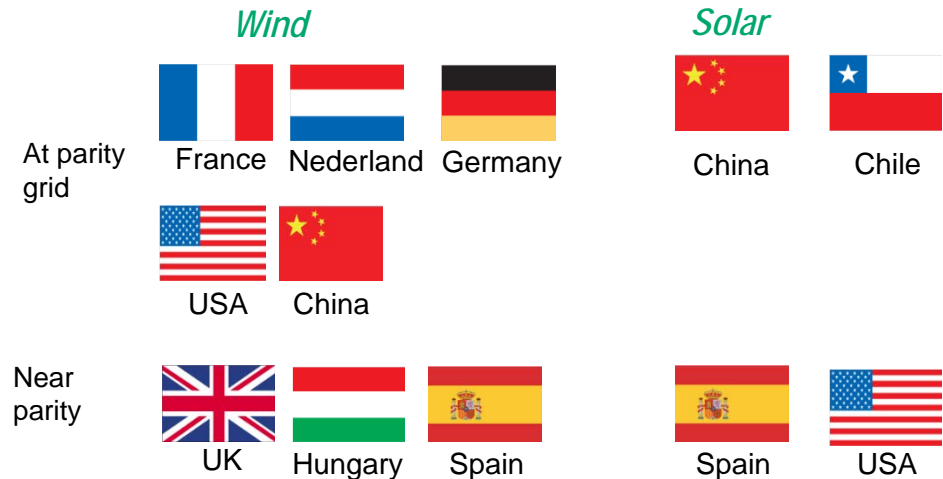


Renewables are competing in the most favorable markets with conventional ones

Externalities may weigh on this competition :

- Intermittence: not an issue in industrialized countries until 2020 at least (penetration too low) < 10% LCoE. Back-up will be provided by existing thermal plants. This would lead to capacity payment spread over all players => this is an opportunity for conventional operators, not a risk for renewable ones.
- Environmental: materialized in the carbon prices. Negative for conventional
- Security of supply/fuel diversification: is an important positive externality, especially in the EU (reliance on Russia/OPEC)

Markets at economic maturity



At parity (1): Generation costs of greenfield solar plants is cheaper, in current market forecasts, than those of a thermal conventional plant (gas-fired power plant)

Near Parity: Greenfield solar plant less than 20% more expensive than a thermal conventional one

Conclusion: the energy transition is definitely a financial issue

1. It is a Risk issue for the banks

- Public policies can have a strong impact on clients business model
- Some assets will loose value
- Stress tests: regulators are expecting banks to explain how they take the carbon risk into account in their financing and investment strategies
- Rating agencies are expecting corporates to explain their climate strategy and resilience.

2. It is a great business opportunity

- Renewable energies have become profitable in a number of countries
- Energy efficiency market is huge: USD 650 billion are annually required to achieve the efficiency objectives already pledged by major economies around the world
- The energy transition is at the heart of the strategy of many of our clients

3. We face strong external expectations

- In the frame of COP 21, banks are expected by many external stakeholders to take a strong position as finance will be a key issue in the negotiation

