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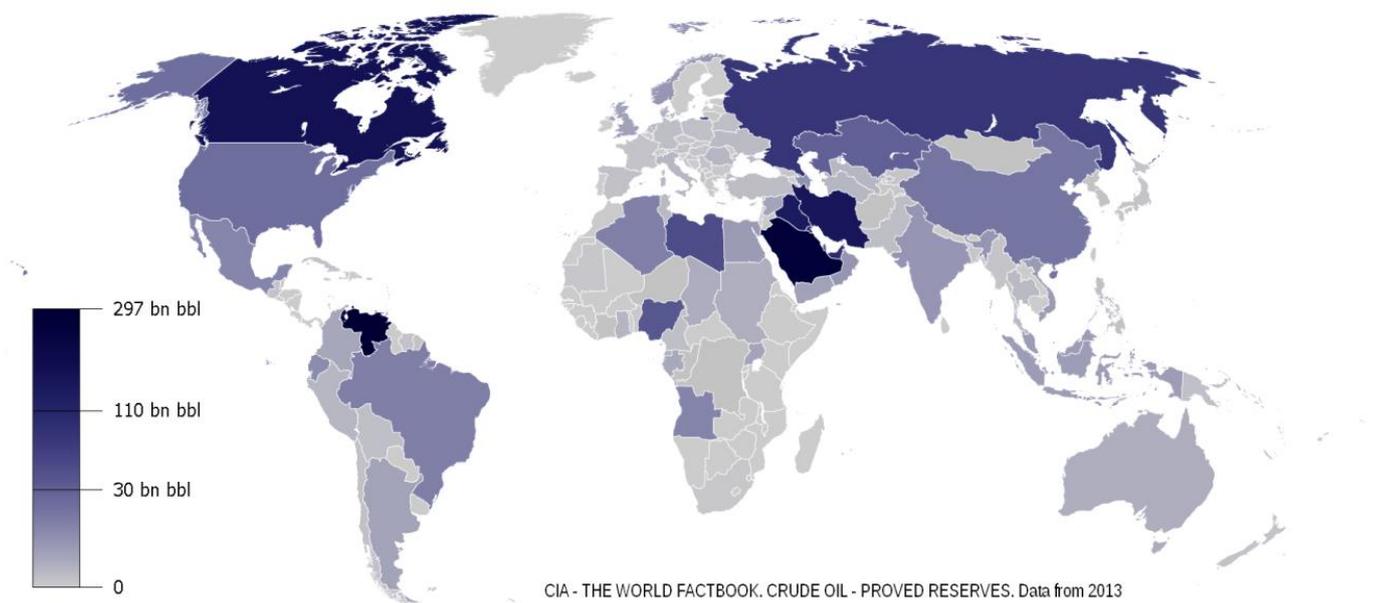


**RESEARCH REPORT
GENERAL ASSEMBLY**

**ISSUE: SOLUTION FOR ENERGY TRANSITION AND EMISSION REDUCTION
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INTRODUCTION:

When former US President Wilson announced in 1924 the rarefaction of oil and predicted its imminent disappearance, the global industry and public opinion began to consider energy transition. However, the actual amount of exploitable oil has not ceased to increase over these past ninety years. The estimations stated that 720 billion barrels were exploitable in 1973, whereas experts now agree on an amount of 1750 billion barrels. Furthermore, due to technology, both oil prospection and production are becoming easier - albeit not necessarily cheaper - and there are still "terrae incognitae" over the world. On the other hand, energy transition is nowadays realistic, unlike a few decades ago. Indeed, hybrid and electric cars have been developed and improved on as technology improved. The global wind farm park continues to expand, and the use of biofuels is increasing, but the use of finite fossil fuels, not just oil but coal and natural gas keeps waxing as well. This reflects the tremendous global needs of energy of emerging countries, which gives them a major role to play in the energy transition issue. Also, fossil fuels, emitting Greenhouse gas and nuclear waste are very dangerous to climate, ecosystems and are seriously and increasingly damaging the earth. Thus, although the world could afford carrying on with non-renewable energy sources such as oil, fossil fuels and not totally reliable nuclear plants, will we survive?



The main oil-extractors in the world still have important oil reserves and the recent price fluctuations make this resource cheaper.

Global warming facts, according to IPCC:

- Carbon-dioxide concentration is 40% higher than in pre-industrial times
- Earth's surface warmed 0,85°C from 1880 to 2012
- Since 1979, Arctic sea ice has been reduced by 3,8% every decade
- By 2100, the global sea level is likely to rise between 26 and 82 cm
- Only an aggressive mitigation scenario can maintain the temperature rise under 2°C

KEY TERMS

ENERGY TRANSITION: this is the shift by several countries to sustainable economies by means of renewable energy, energy efficiency and sustainable development. The final goal is the abolishment of non-renewable energy sources.

SUSTAINABLE DEVELOPMENT: development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

FOSSIL FUELS: hydrocarbon-based fuels, such as petroleum, coal or natural gas, derived from living matter of a previous geologic time.

RENEWABLE ENERGY: Any energy resource that is naturally regenerated over a short time scale and derived directly from the sun (such as thermal, photochemical, and photoelectric), indirectly from the sun (such as wind, hydropower, and photosynthetic energy stored in biomass), or from other natural movements and mechanisms of the environment (such as geothermal and tidal energy). Renewable energy does not include energy resources derived from fossil fuels, waste products from fossil sources, or waste products from inorganic sources.

TIMELINE OF EVENTS

- ◆ 19th century: industrial revolution, generalization of the use of coal in Britain
- ◆ 1859: Discovery of petrol in the USA. Three years later, the country produced 3 million
- ◆ 1951: Settling of the first nuclear plant in the USA
- ◆ 1972: General Motors invented the first hybrid car
- ◆ 1973 and 1979: first then second oil shocks, leading to a brutal increase of crude oil's
- ◆ April 1986: nuclear accident in Chernobyl, USSR
- ◆ 1988: Creation of the Intergovernmental Panel on Climate Change
- ◆ 1994: The United Nations Framework Convention on Climate Change, main interna-
- ◆ 1997: Kyoto protocol: it aimed to reduce the production of Greenhouse gas, and
- ◆ 2002: Creation of the world's biggest offshore eolian park in Denmark
- ◆ 2009: Commissioning of the world's biggest hydraulic dam
- ◆ March 2011: Nuclear accident in Fukushima, Japan, due to a tsunami
- ◆ 2012: 1384 Chinese colliers were killed in firedamp accidents

MAJOR COUNTRIES AND ORGANISATIONS INVOLVED

IPCC: The Intergovernmental Panel on Climate Change (IPCC) is the leading international body for the assessment of climate change. It was established by the United Nations Environment Program (UNEP) and the World Meteorological Organization (WMO) in 1988 to provide the world with a clear scientific view on the current state of knowledge in climate change and its potential environmental and socio-economic impacts. In the same year, the UN General Assembly endorsed the action by WMO and UNEP in jointly establishing the IPCC.

The IPCC is a scientific body under the auspices of the United Nations (UN). It reviews and assesses the most recent scientific, technical and socio-economic information produced worldwide relevant to the understanding of climate change. It does not conduct any research nor does it monitor climate related data or parameters.

Thousands of scientists from all over the world contribute to the work of the IPCC on a voluntary basis. Review is an essential part of the IPCC process, to ensure an objective and complete assessment of current information. IPCC aims to reflect a range of views and expertise. The Secretariat coordinates all the IPCC work and liaises with Governments. It is supported by WMO and UNEP and hosted at WMO headquarters in Geneva.

The IPCC is an intergovernmental body. It is open to all member countries of the United Nations (UN) and WMO. Currently 195 countries are members of the IPCC. Governments participate in the review process and the plenary Sessions, where main decisions about the IPCC work program are taken and reports are accepted, adopted and approved. The IPCC Bureau Members, including the Chair, are also elected during the plenary Sessions.

Because of its scientific and intergovernmental nature, the IPCC is a unique opportunity to provide rigorous and balanced scientific information to decision makers. By endorsing the IPCC reports, governments acknowledge the authority of their scientific content. The work of the organization is therefore policy-relevant and yet policy-neutral, never policy-prescriptive.

IEA: The International Energy Agency (IEA) is an autonomous organization which works to ensure reliable, affordable and clean energy for its 29 member countries and beyond.

Founded in response to the 1973/4 oil crisis, the IEA's initial role was to help countries co-ordinate a collective response to major disruptions in oil supply through the release of emergency oil stocks to the markets.



While this continues to be a key aspect of its work, the IEA has evolved and expanded. It is at the heart of global dialogue on energy, providing authoritative statistics, analysis and recommendations.

Today, the IEA's four main areas of focus are:

- Energy security: Promoting diversity, efficiency and flexibility within all energy sectors;
- Economic development: Ensuring the stable supply of energy to IEA member countries and promoting free markets to foster economic growth and eliminate energy poverty;
- Environmental awareness: Enhancing international knowledge of options for tackling climate change; and
- Engagement worldwide: Working closely with non-member countries, especially major producers and consumers, to find solutions to shared energy and environmental concerns.

GCF: The Green Climate Fund is a UN created organism that defines itself as follows: "Given the urgency and seriousness of climate change, the purpose of the Fund is to make a significant and ambitious contribution to the global efforts towards attaining the goals set by the international community to combat climate change.

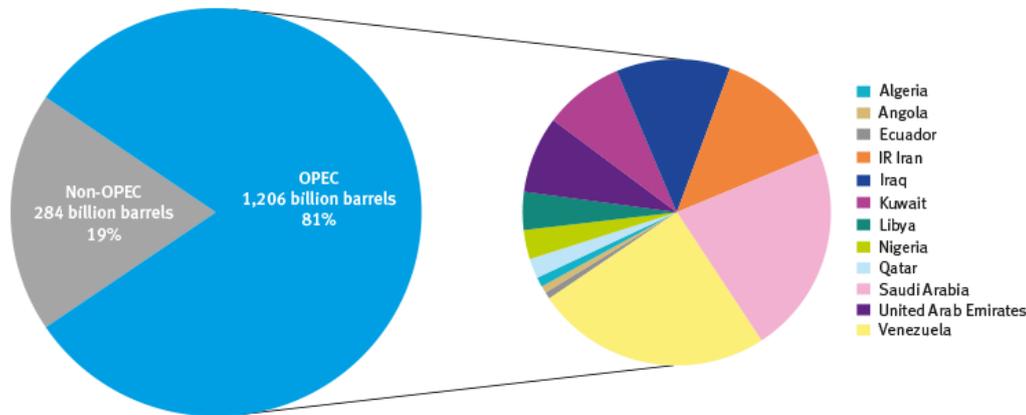
The Fund will contribute to the achievement of the ultimate objective of the United Nations Framework Convention on Climate Change (UNFCCC). In the context of sustainable development, the Fund will promote the paradigm shift towards low-emission and climate-resilient development pathways by providing support to developing countries to limit or reduce their greenhouse gas emissions and to adapt to the impacts of climate change, taking into account the needs of those developing countries particularly vulnerable to the adverse effects of climate change. The Fund will be guided by the principles and provisions of the Convention."

Greenpeace: it is the largest direct-action environmental organization in the world, promoting sustainable agriculture, trying to sensitize people about the dangers and consequences of climate changes, toxic chemicals, nuclear industry, and denouncing global warming, marine pollution, and deforestation. This NGO is based in more than 40 countries and is exclusively funded by individuals.

OPEC: The Organization of the Petroleum Exporting Countries (OPEC) is a permanent, intergovernmental Organization, created at the Baghdad Conference on September 10–14, 1960, by Iran, Iraq, Kuwait, Saudi Arabia and Venezuela. The five Founding Members were later joined by nine other Members: Qatar (1961); Indonesia (1962) – suspended its membership from January 2009; Libya (1962); United Arab Emirates

(1967); Algeria (1969); Nigeria (1971); Ecuador (1973) – suspended its membership from December 1992- October 2007; Angola (2007) and Gabon (1975–1994). OPEC had its headquarters in Geneva, Switzerland, in the first five years of its existence. This was moved to Vienna, Austria, on September 1, 1965.

OPEC share of world crude oil reserves, 2013



OPEC proven crude oil reserves, at end of 2013 (billion barrels, OPEC share)

Venezuela	298.4	24.7%	Iraq	144.2	12.0%	Libya	48.4	4.0%	Algeria	12.2	1.0%
Saudi Arabia	265.8	22.0%	Kuwait	101.5	8.4%	Nigeria	37.1	3.1%	Angola	9.0	0.7%
IR Iran	157.8	13.1%	UAE	97.8	8.1%	Qatar	25.2	2.1%	Ecuador	8.8	0.7%

Source: OPEC Annual Statistical Bulletin 2014.

The OPEC countries share 81 % of the world’s proven oil reserves.

OPEC's objective is to co-ordinate and unify petroleum policies among Member Countries, in order to secure fair and stable prices for petroleum producers; an efficient, economic and regular supply of petroleum to consuming nations; and a fair return on capital to those investing in the industry.

RELATED TREATIES

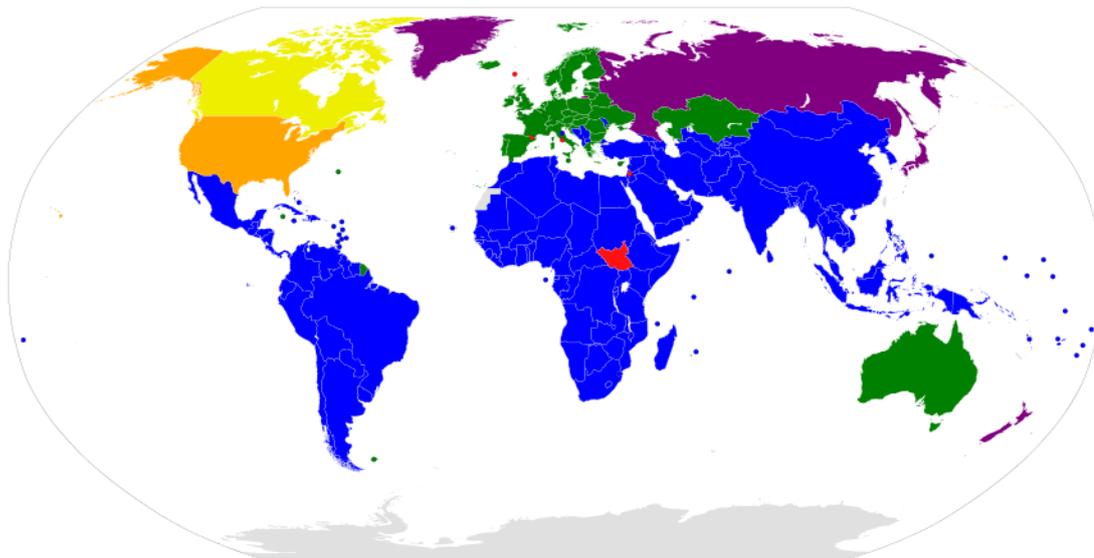
Multilateral agreements on reduction of emissions and the promotion of energy transition have started with the 1992 Rio Earth Summit, and the creation of the *UNFCCC (United Nations Framework Convention for Climate Change)*. This Convention entered in force in 1994, and the 195 countries which have ratified it are called the Parties. They meet annually at the Conference of Parties (COP) to discuss and negotiate multilateral responses to Climate Change. The main aim of UNFCCC is to prevent dangerous human interference with our planet’s climate.

The Kyoto Protocol was signed in 1997 by 83 countries and entered into force in February 2005. It implements internationally binding emissions reduction targets. The detailed rules of its setting up were adopted in 2001 at COP 7 in Marrakesh. The first period of commitment stretched from 2008 to 2012 while the second period stretches from 2013 to 2020.

Under this Protocol, countries are committed to meet their targets through national policies. The protocol offers additional means to meet these targets by three market-

based mechanisms: International Emissions Trading; Clean Development Mechanism; Joint Implementation.

Yet the Kyoto Protocol, although it can bring great hope, is not very efficient for true progress in emissions reduction. As you can see on the map below, there are not much parties truly involved. The world's two largest emitting countries: China (8,286,892 kt of CO₂ emissions in 2010) and United States of America (5,433,057 kt), either have no binding targets or have not ratified the Protocol.



Map of the different parties to the Kyoto Protocol (Source : wikipedia)

- Parties with binding targets in the first period but not second period
- Parties with binding targets in the second period
- Parties without binding targets
- Parties with binding targets in the first period but withdrew from the Protocol
- Signatories to the Protocol that have not ratified
- Countries or observers which are not party to the Protocol

At the Cancun Conference in 1981, the UNFCCC implemented NAPs (National Adaptation Plans) which are means for the countries to identify their needs, and the development of strategies. The main aims are to reduce vulnerability to the impacts of climate change as well as facilitate a country's integration of climate change policies in a coherent way, at various levels and in the relevant sectors. NAPs encourage the actions to be country-driven and to follow a transparent approach, while taking into account all communities and ecosystems.

NAPAs (National Adaptation Programs of Action) have been implemented by the UNFCCC to help LDCs identify priorities to adapt to climate change.



In 2010, UNFCCC established the Green Climate Fund, the Convention's institution which operates the financial mechanisms. It promotes the shift towards low-emission and climate resilient development pathways. Its main aim is to support developing countries in their implementation of strategies.

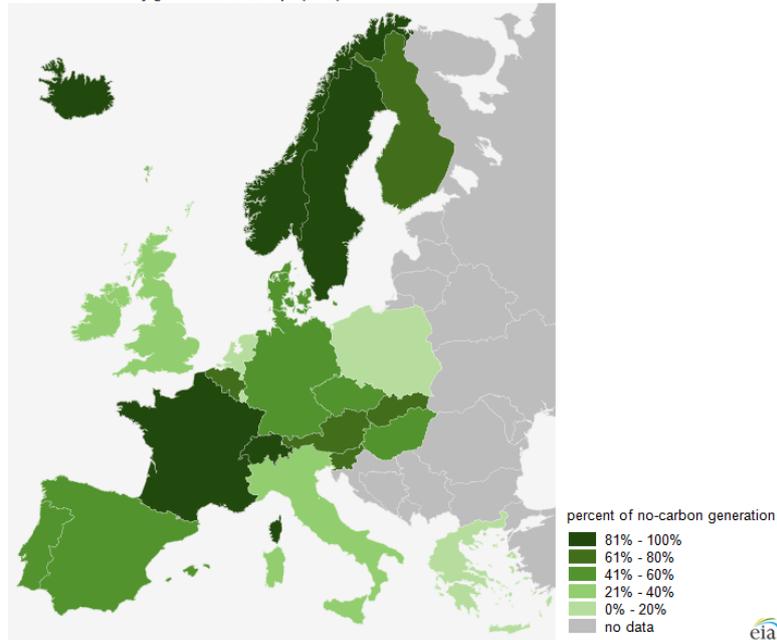
Climate Change summits take place every year in the framework of the UNFCCC, but they are not always rewarding. The 2009 Copenhagen conference for instance, has merely recognised the scientific case for keeping temperature rises to no more than

2°C, but does not contain commitments to emissions reduction. The next COP will take place in Paris in Autumn 2015. Its aims are ambitious : an international agreement which would enable to prevent the temperature from rising more than 2°C. It places the local actions of civil society organisations as well as local enterprises and level-state policies at the centre of its action. To prepare the conference, new emissions reduction targets were submitted by the parties and provisionally added to the agreement for the first trimester of 2015.

The European Union is very active in energy transition and multilateral decisions have been made:

- The EU Emissions Trading System gathers the 28 EU countries as well as Norway, Iceland and Liechtenstein. This policy is based on what is called Cap and Trade: countries receive or buy emission allowances which they can trade with one another as needed. If the bought allowances are not sufficient to cover all of the emissions, then heavy fines are imposed. This financial value given to each tonne of emission saved, promotes investments in clean, low-carbon technology. The ETS aims for a reduction of emission of 80 to 95 % compared to 1990 by 2050. The European policy has already proved itself efficient, as the rates of no-carbon energy sources in EU has increased from 50 to 55% in recent years.
- With the ETS, the EU has developed the NER300 program. This program is a financing instrument managed jointly by EU, European Investment Bank and Member states. It is a subsidy organ for innovative technologies and thus promotes the shift towards energy transition and reduction of emissions.

No-carbon electricity generation in Europe (2012)



European countries are gradually increasing their share of no-carbon generation sources.

NGOs are also involved in the energy transition and *Greenpeace* proposed an Energy [R]evolution in 2005. It provided a pathway for a better protection of our climate through investment in renewable energies. Among others, it proposes to put an end to subsidies on fossil fuels and to increase investments in research and development for innovative technologies. The aim is to reduce consumption of fossil fuels, to promote renewable forms of energy and reach energy efficiency.

In 2005, 2007, 2010, and 2012, a Global Energy [R]evolution scenario was published. In the framework of this Energy [R]evolution, Greenpeace, supported by GWEC (Global Wind Energy Council) and the EREC (European Renewable Energy Council), demand that several policies be implemented in the energy sector:

1. End subsidies for fossil fuels and nuclear energy
2. Implement a *Cap and Trade* emissions trading system (internalise the social and economic costs of energy production)
3. Implement efficiency standards for energy consuming appliances, buildings and vehicles
4. Set up legally binding targets for renewable energy and heat and power generators
5. Reform electricity market by guaranteeing priority access to the grid for renewable power generators
6. Create efficient labelling mechanisms to provide reliable environmental product information
7. Provide defined and stable returns for investors, for example by feed-in tariff programmes
8. Investment in research and development projects for renewable energy and energy efficiency

POSSIBLE SOLUTIONS

- To reduce emissions, giving a price to carbon emissions could push industrialists to invest much more into innovative technologies and renewable energies.
- LEDCs and LDCs could be helped into an efficient energy transition and find ways of implementing a stable sustainable development.
- Sustainable development could be pursued in emerging and developed countries, notably in urban spaces, in which energy consumption as well as carbon emissions are very high. Eco towns on the model of Bedzed in the UK.
- Innovation could be boosted in all sectors (production of energy, clean technology).
- The OPEC countries and other main fossil fuel producing countries could be progressively led to reduce their extraction and exportations and encouraged to diversify their economies, taking advantage of solar power for example.

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