EU Emissions Trading System (ETS) legislation impact on Carbon Capture and Storage (CCS)

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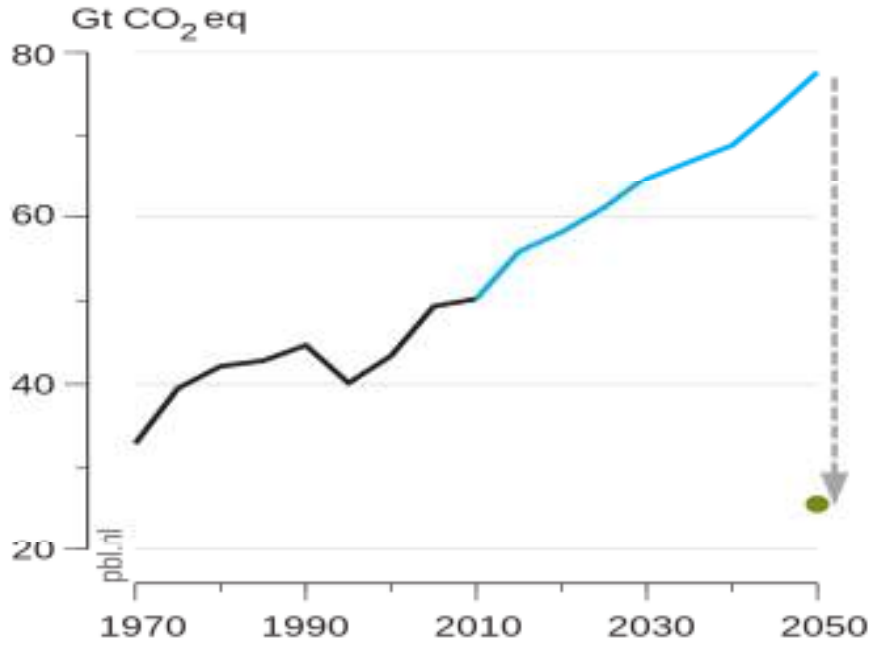
Global greenhouse gas emissions and options to reduce emissions

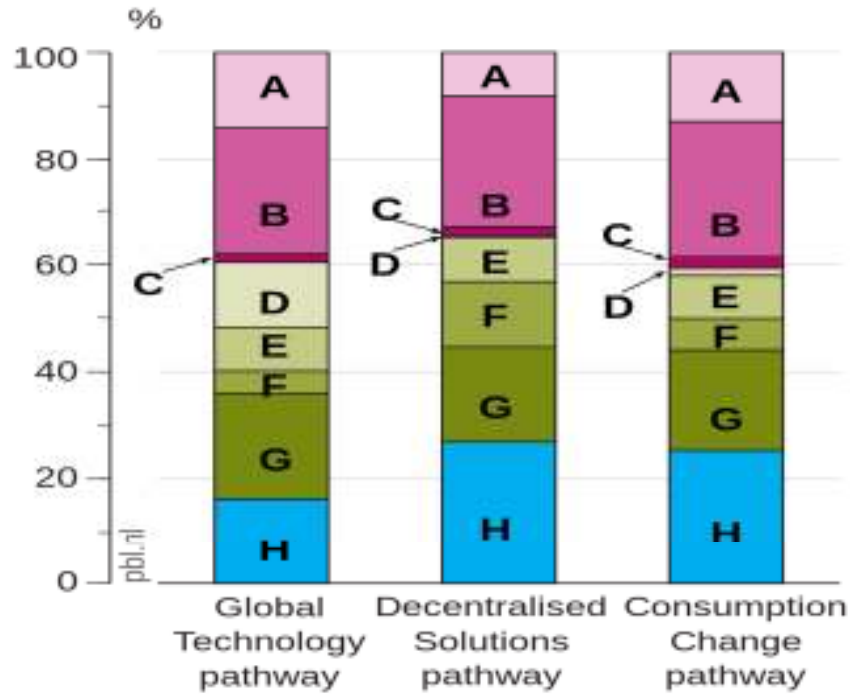
Greenhouse gas emissions



History
Trend scenario
Goal

Policy gap

Contribution to cumulative emission reduction, 2010 – 2050



A Avoid deforestation
B Reduce other greenhouse gases
C Reduce other energy-related emissions
D Increase nuclear power
E Increase bio-energy
F Increase solar and wind power
G Increase CO_2 capture and storage
H Improve energy efficiency

Source: PBL

Lobbing of many multinational corporations

- such as Shell, Statoil, the Carbon Capture and Storage Association, E.On and Électricité de France
- have lined up to support the EU's efforts to rescue the ETS in hand with financial actors such as carbon traders, brokers and verifier firms.
- These companies profit from

a) selling

b) or using fossil fuels and trading carbon

- and hence wish to restore confidence in the collapsing market.

Greenhouse gas emissions. Is the EU exemplary?

CO2 emissions in the world

Index: 100, 1990.

Source: International Energy Agency (IEA), 2012
(data are not climate variations adjusted).

Since 1990, the EU managed to lower its CO2 emissions by 18%. However, it's less due to a real emission reduction effort than to international compensation mechanisms.

The European Emissions Trading System (EU ETS)

Polluting companies buy emission allowances. Thus they pay for polluting and can resell their untapped allowances.

The more expansive the ton of CO2, the less companies are enticed to pollute.

5 euros

That's the price of a ton of CO2 nowadays. In 2008, it cost 30€.

20 years of regulation

1992 — The third Earth Summit in Rio de Janeiro established the United Nations Framework Convention on Climate Change. This UNFCCC will pave way for the Kyoto protocol.

1997 — The Kyoto protocol was initiated to reduce greenhouse gas emmissions by 5,5% between 1990 and 2008/2012. Its entry into force in 2005 foresees emmissions allowances.

2005 — The Emissions Trading System was introduced on January 1st. It enables companies to resell their untapped "emissions" allowances, creating thus a carbon market in Europe.

2010 — In France, Grenelle 2 law requires companies and local administrations to make a carbon footprint assessment every three years.

2012 — To save the Emissions Trading System, the European Commission suggests "backloading". Meaning a temporary reduction of the amount of emmissions alowances available on the market. The goal is to freeze tons of greenhouse gases to increase carbon prices.

The 2020 climate and energy package

- These targets, known as the "20-20-20" targets, set three key objectives for 2020:

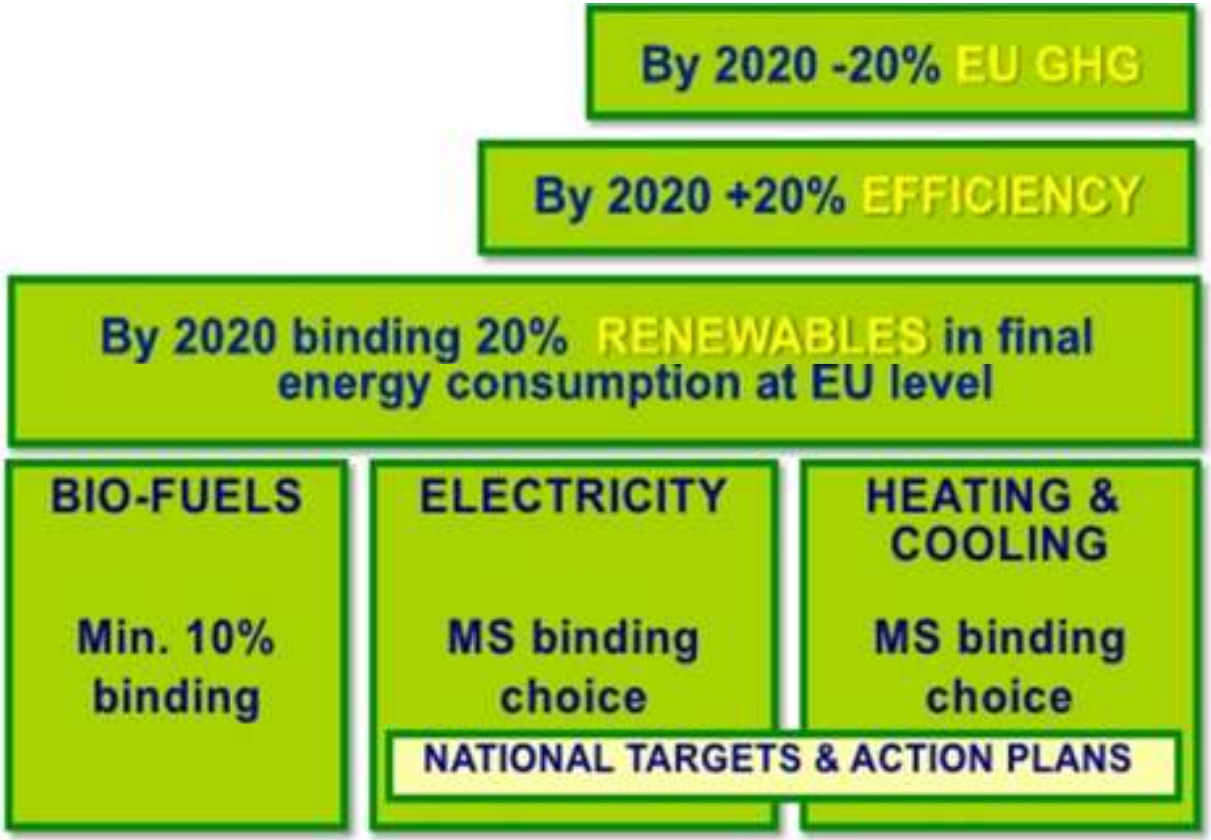
I. A 20% reduction in EU greenhouse gas emissions from 1990 levels;

II. Raising the share of EU energy consumption produced from renewable resources to 20%;

III. A 20% improvement in the EU's energy efficiency - 20% cut in energy consumption through improved energy efficiency by 2020

- The climate and energy package comprises four element of complementary legislation which are intended to deliver on the 20-20-20 targets

European Union 20-20-20 Energy Policy



As a result the EU

- share of worldwide CO2 emissions is greater reduced:
- it was responsible for 11% of total world CO2 emissions in 2011, but this is expected to decrease to 7% in 2035,

Source - the Internal Energy Agency

- This is the result of

a. continued emissions reduction and efficiency improvements in the EU
b. economic development in other regions

Four measures

I. Reform of the EU Emissions Trading System (EU ETS)

II. National targets for non-EU ETS emissions

III. National renewable energy targets

IV. Carbon capture and storage

I Reform of the EU Emissions Trading System (EU ETS)

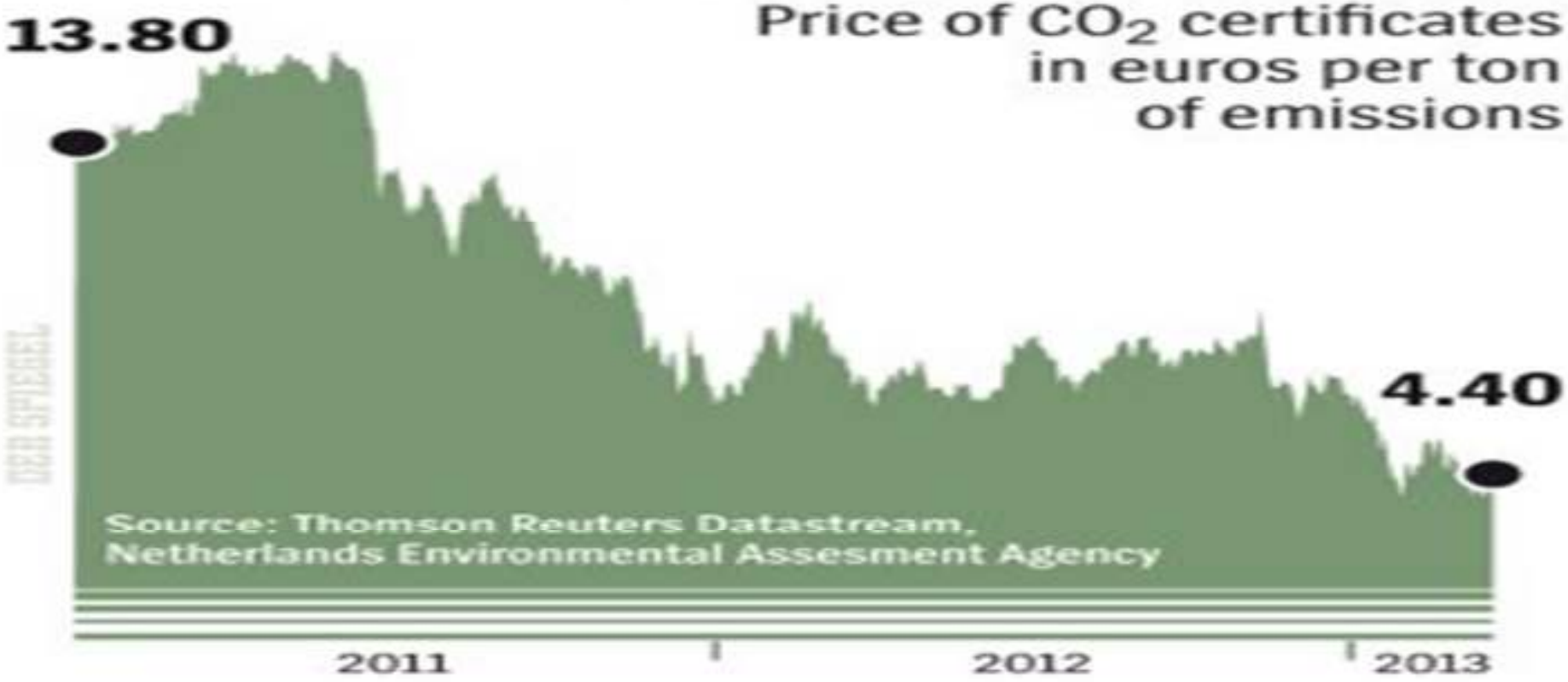
- The EU ETS is the key tool for cutting industrial greenhouse gas emissions most cost-effectively.
- The climate and energy package includes a comprehensive revision and strengthening of the legislation which underpins the EU ETS, the Emissions Trading Directive.
- The revision applies from 2013, the start of the third trading period of the EU ETS.

Major changes include

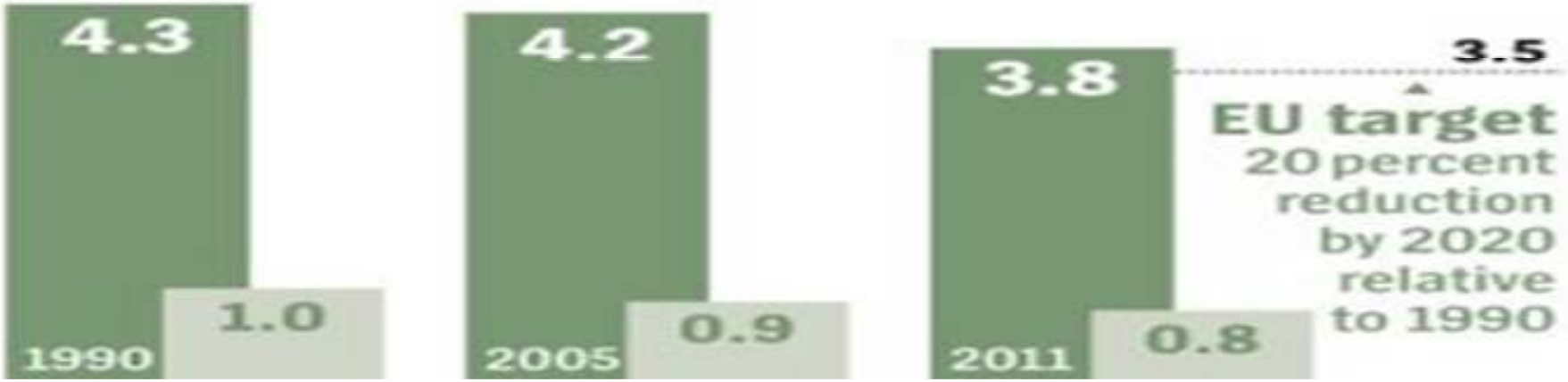
- the introduction of a single EU-wide cap on emission allowances in place of the existing system of national caps.
- The cap will be cut each year so that by 2020 emissions will be 21% below the 2005 level.
- The free allocation of allowances will be progressively replaced by auctioning, starting with the power sector.
- The sectors and gases covered by the system will be slightly widened.

Discount Pollution

Price of CO_2 certificates in euros per ton of emissions



CO_2 emissions in billions of tons EU-27 Germany



BENEFITS OF REFORM OF EU ETS

1) Control of 100% of fossil carbon.
2) Protecting EU businesses from unfair competition.
3) Budget discipline, raising the price of emissions to their proper level.
4) No need for legally-binding national targets.
5) Simplicity:

a) Reduce administration costs

b) Reduce fraud

IV Carbon capture and storage

- The fourth element of the climate and energy package is a directive creating a legal framework for the environmentally safe use of carbon capture and storage technologies.
- Carbon capture and storage involves capturing the carbon dioxide emitted by industrial processes and storing it in underground geological formations where it does not contribute to global warming.
- The directive covers all CO2 storage in geological formations in the EU and lays down requirements which apply to the entire lifetime of storage sites.

CCS

Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide

A legal framework for the safe geological storage of carbon dioxide

- The directive on the geological storage of CO_2 establishes a legal framework for the environmentally safe geological storage of CO_2
- to contribute to the fight against climate change.
- It covers all CO_2 storage in geological formations in the EU and the entire lifetime of storage sites.
- It also contains provisions on the capture and transport components of CCS, though these activities are covered mainly by existing EU environmental legislation, such as

a) the Environmental Impact Assessment (EIA) Directive

b) the Industrial Emissions Directive, in conjunction with amendments introduced by the CCS Directive.

Security of the transport network and storage sites

- The substances captured to be stored must consist overwhelmingly of CO_2 to prevent any adverse effects on the security of the transport network or the storage site. The operation of the site must be closely monitored and corrective measures taken in the case that leakage does occur.
- The Directive covers in addittion closure and post-closure obligations, and sets out criteria for the transfer of responsibility from the operator to the Member State.
- The operator must establish a financial security before the injection of CO_2 starts to ensure that the requirements of the CCS Directive and the Emissions Trading Directive can be met.

The **European Union Emissions Trading System** (**EU ETS**)
European Union Emissions Trading Scheme

- was the first large greenhouse gas emissions trading scheme in the world, and remains the biggest.
- It was launched in 2005 to combat climate change and is a major pillar of EU climate policy

As of 2014, the EU ETS covers

- more than 11,000 factories, power stations, and other installations with a net heat excess of 20 MW
- The installations regulated by the EU ETS are collectively responsible for close to half of the EU's emissions of CO_2 and 40% of its total greenhouse gas emissions

Under the 'cap and trade' principle

- a cap is set on the total amount of greenhouse gases that can be emitted by all participating installations.
- 'Allowances' for emissions are then auctioned off or allocated for free, and can subsequently be traded. Installations must monitor and report their CO_2 emissions, ensuring they hand in enough allowances to the authorities to cover their emissions.
- If emission exceeds what is permitted by its allowances, an installation must purchase allowances from others.
- Conversely, if an installation has performed well at reducing its emissions, it can sell its leftover credits. This allows the system to find the most cost-effective ways of reducing emissions without significant government intervention.

The scheme has been divided into "trading periods"

- The first ETS trading period lasted three years, from January 2005 to December 2007.
- The second trading period ran from January 2008 until December 2012, coinciding with the first commitment period of the Kyoto Protocol.
- The third trading period began in January 2013 and will span until December 2020.

Phase I

in the first phase (2005–2007)

- the EU ETS included more than 11,000 installations, representing approximately 40% of EU CO_2 emissions, covering
- energy activities:

a) combustion installations with a rated thermal input exceeding 20 MW

mineral oil refineries

coke ovens

a) production and processing of ferrous metals, mineral industry

cement clinker,

glass and ceramic bricks

- from 2005 through 2007, the ETS reduced carbon emissions by 120 million to 300 million metric tons, or roughly 2–5% below the “business-as-usual” scenario

EU ETS 2009 & 2008 emissions by country

reported emissions data in Ktonnes

Country	2008 emissions	2009 emissions	NAP II
Austria	31 979	27 341	30 700
Belgium	55 452	46 107	58 500
Bulgaria	38 301	31 997	42 300
Cyprus	5 577	84	5 500
Czech Republic	24 059	22 050	86 800
Denmark	26 542	25 453	24 500
Estonia	13 541	10 323	12 700
Finland	36 114	34 208	37 600
France	112 632	99 621	132 300
Germany	467 285	427 977	451 900
Greece	69 854	63 659	68 300
Hungary	26 907	22 257	29 900
Ireland	20 369	17 179	22 300
Italy	216 673	181 149	201 600
Latvia	2 701	2 252	3 400
Lithuania	3 421	3 151	8 800
Luxembourg	2 099	2 182	2 500
Malta	2 019	1 897	2 100
Netherlands	82 941	80 934	86 300
Poland	191 050	181 122	208 500
Portugal	29 930	28 260	34 800
Romania	55 143	42 342	75 400
Slovakia	8 885	7 183	32 600
Slovenia	8 853	8 067	8 300
Spain	163 245	136 703	152 300
Sweden	20 028	17 453	22 500
United Kingdom	264 881	231 730	245 600
TOTAL EU27	**1 980 481**	**1 752 681**	**2 088 000**

Phase II 2008–12

The second phase expanded the scope of the by introduction in the EU's "Linking Directive"

a) **Clean Development Mechanism** defined in the Kyoto Protocol (IPCC, 2007) that provides for emissions reduction projects which generate Certified Emission Reduction units which may be traded in emissions trading schemes

- **Joint implementation credits** - one of three flexibility mechanisms set out in the Kyoto Protocol to help countries with binding greenhouse gas emissions targets
- Phase II coincided with the global economic recession but introduced tighter emissions targets and achieved additional reductions of approximately 340 million metric tons in its first two years (2008–2009), or roughly 8% below projected business-as-usual emissions.

the final decision Commission Decision IP/07/1614
of 26 October 2007

- on the national allocation plans for phase II of the EU ETS.
- In this decision it was established that the annual average quantity of allowances to issued or to be issued in phase II (2008-2012) of the EU ETS
- stands at 2,135 million tonnes (or 2.13 gigatonnes
- of which

a) 2.08 to installations present under phase I

b) and 0.05 Gt to installations related to an expansion of the scope as from 2008)

Phase III

For Phase III (2013–20)

- the European Commission has proposed a number of changes, including

a) the setting of an overall EU cap, with allowances then allocated to EU members

b) tighter limits on the use of offsets

c) limiting banking of allowances between Phases II and III;

d) and a move from allowances to auctioning

Phase 4

will commence on 1 January 2021 and finish on 31 December 2028

- On 22 January 2014, the European Commission proposed two structural reform amendments to the ETS directive of the 2008 Climate Package
- a) the linear reduction factor, at which the overall emissions cap is reduced, from 1.74% (2013-2020) to **2,2% each year from 2021 to 2030** thus reducing 43% of EU CO2 emissions in the ETS sector as compared to 2005.
- b) the creation of a 12% "automatic set-aside" reserve mechanism of verified annual emissions (at least a 100 mln CO2 permit reserve) in the fourth ETS period from 2021 to 2030, thus creating a *quasi* carbon tax or *carbon price floor* with a price range set each year by the European Commission's Directorate General for Climate Change

Problems

The EU ETS has been criticized for several failings,

- less than 50% of fossil carbon is covered
- over-allocation - because EU governments based the system's initial caps and emissions allowance allocation on *estimates of regulated* entities' emissions rather than on *actual historical emissions data, governments issued too* many emissions allowances
- windfall profits by passing through to consumers the price of allowances that they received for free.

a) price volatility

b) economy slump in Europe has caused the price of the emission certificates to drop dramatically, currently hovering around €5 ($6.50) per ton of carbon dioxide

c) less energy consumption and industrial production, resulting in a surplus of some 500 million certificates.

d) having caused a disruptive spike in energy prices

The European Union Emissions Trading System (EU ETS)

- is the world's largest market-based policy for reducing greenhouse gas emissions.
- Operating since 2005, the EU ETS sets a decreasing cap on the greenhouse gases that installations can emit in 31 countries, including Poland.
- The program includes more than 11,000 factories, power stations, and other installations in 30 countries and operates in the 28 EU countries and the three EEA-EFTA states (Iceland, Liechtenstein and Norway)
- "Emission allowances", tradable permits to emit one ton of greenhouse gases,
- are allocated for

I. free

II. or through auctions

Covered entities receive

- European emission allowances (EUAs).
- For each allowance they can emit 1 ton of CO2.
- But if their CO2 emissions exceed the number of allowances they have, a factory can purchase EUAs from other installations or countries.
- Conversely, if an installation has performed well at reducing its carbon emissions, it can sell its leftover EUAs

The success of the EU ETS

- has inspired other countries and regions to launch cap and trade schemes of their own.
- The EU aims to link up the ETS with compatible systems around the world to form the backbone of an expanded international carbon market.

For example

- The European Commission has agreed in principle to link the ETS with Australia's system in stages from mid-2015

The EU has around

- 2.000 million emission allowances for 12.000 industrial facilities in all its territory, and its carbon market is valued at around 90.000 million Euros per year.
- Due to the oversupply, the ETS is not achieving its energy efficiency and environmental technologies goals.

This is impairing

a) the innovation

b) and competitiveness of the EU member states

- The suspension of the auction will

a) reduce the surplus of allowances by 40% and

b) make it possible to set the price for a ton of carbon somewhere between 6 and 8 Euros (today the price is 4,80)

Situtation in November 2014

EU to cut carbon emissions by 40% by 2030

- EU will cut its greenhouse gas emissions by 40% by 2030, compared with 1990 levels, the toughest climate change target of any region in the world, and will produce 27% of its energy from renewable sources by the same date.
- Neighbours Germany and Poland
  might appear at opposite ends of the spectrum on the European climate debate,
  but both rely heavily on coal, handing them similar challenges
- CO2 allowances would need a market value of 40 euros to impact the price of coal-fire power, but the average price is currently around 5 euros

The Climate and Energy Framework 2030

- was first presented by the European Commission in January 2014 , with the aim of creating a roadmap for energy policy beyond targets already in place for 2020.
- The package was debated by EU heads of state in March and June 2014, but they failed to reach an agreement,
- instead giving themselves until the end of November 2014
- The European Commission position is that a 40 % reduction in greenhouse gas emissions compared to 1990 is the “centre piece” of the 2030 framework.

The 2030 framework includes

- proposals to delay the next batch of allowances due to be auctioned in the current period, and create a market stability reserve (MSR) to regulate the supply of allowances, which would be brought in at the beginning of the next trading period in 2021.
- But there are questions over whether these measures will have a sufficient impact.
- The Market Stability Reserve proposed by the EU commission will not increase prices in the European Trading Scheme because the allowances are only reduced

a) partly

b) and temporarily

The main problem for the current prices on junk status seems to be the insufficient credibility of European climate policy. We have to reform emissions trading such that we put a minimum price on carbon

With the EU

- potentially setting the pace for climate targets worldwide at the UN Climate Change Conference in Paris in 2015,
- Sweden has called for the CO_2 reduction target to be raised to 50 per cent,
- while German politicians have spoken of 40 per cent as a “minimum”.
- In the beginning of the November Polish Prime Minister Ewa Kopacz threatened to veto the carbon reduction target, saying she was not prepared to accept the economic impact of rising energy prices.
- low income and coal-dependent economies like Poland might be talked round with funds to help them reach the targets.

Germany's energy transition

- the plan to simultaneously phase out nuclear power and cut carbon emissions through a push into renewable energy
- has the support of the grand coalition government of Social-Democrats and the Christian Democrats
- and saw renewable power cover more than a quarter of the country's energy needs in the first nine months of 2014.
- Germany already has climate reduction targets in place of 40 per cent by 2020 and 55 per cent by 2030, although the country's CO_2 emissions have been on the rise again since hitting a low point in 2009.

at the EU climate summit on 23-24 October 2014

- Germany pushed for a triad of targets for 2030
- with broad backing from the public, and some concerns on the part of industry.
- Speaking in Brussels on 15 October 2014, German Secretary of State for Energy Rainer Baake explained that in addition to a climate target of at least 40 per cent, Germany calls for binding targets for both renewable energy and energy efficiency of at least 30 percent.

Eva Filzmoser, Director at Carbon Market Watch

- *"In the absence of clear rules for companies to stay away from dubious projects that are tainted by human right abuses, we need transparency in order to hold companies accountable for their investment decisions."*
- **Damien Morris, Head of Policy at the Sandbag Climate Campaign**
- *"The Commission has just given a huge gift to those industry lobbyists who routinely exaggerate the costs the EU ETS poses to them. By concealing the number of offsets companies have submitted to comply with the scheme, they have made it much harder to estimate the real costs these companies have faced in the past or are likely to face in the future. We call on the Commission to make the full data available as soon as possible."*

as of 2013 the EU Emissions Trading Scheme

- which is supposed to limit the greenhouse gas emission of all of Europe's power stations and factories, is oversupplied by 2.1 billion carbon allowances.
- With total 2013 emissions under the ETS at 1.9 billion tonnes, this leaves over a year's worth of spare allowances flooding the market.
- The surfeit of allowances has lowered the price of carbon to the region of €5 per tonne of CO2 emitted, too low to drive even the cheapest known forms of emission reduction.
- This has left many of Europe's gas-fired power stations idling, because the price of CO2 can no longer bridge the price differential between coal and gas

The main cause of this oversupply in the EU ETS

- has been a reduced demand for carbon allowances after the recession, which has caused emissions to fall much lower than had been expected when the supply of allowances was fixed.
- But this problem has been severely compounded by companies submitting huge quantities of carbon offsets into the scheme:
- the new data shows that offsets now make up 1.2 billion – more than half – of the current surplus.

Member States have had persistent concerns

- about the level of offsetting taking place within the scheme, with serious environmental and human rights issues attached to specific project types.
- But their ongoing efforts will face a serious barrier as the Commission plans to stop publishing data on the volume and type of offsets surrendered by companies operating in the scheme.
- After failing to publish this offsetting data on May 2nd 2014 , the Commission made a partial concession to environmental groups and on May 14th published a breakdown of the types of offsets released into the scheme as a whole, but that this still leaves companies dangerously unaccountable.

Thank you for your attention