The European perspective on CCS after COP 21

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Climate Action

The Paris Agreement: a historic agreement

- A new chapter in international climate governance and action
- A win for multilateralism
- A strong signal to policy makers, investors and businesses
- Great example of EU unity and leadership

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The Paris Agreement: an ambitious agreement

- ✓ A long-term goal to hold temperature increase to well below 2° C, and pursue efforts to limit to 1.5° C
- ✓ Global emissions to peak as soon as possible, net zero emissions in the second half of the Century
- ✓ Legally binding obligations to maintain successive targets and to pursue domestic mitigation measures – 187 countries have submitted their plans
- ✓ A global stocktake every five years starting in 2018 with increased ambition over time

The Paris Agreement: a transparent agreement

- ✓ All Parties must account for their contributions – track progress on targets
- ✓ Methodologies and common metrics will apply
- ✓ Enhanced transparency and accountability framework, with biennial reporting and expert review
- ✓ No double counting : essential for linking of emission trading systems

The Paris Agreement: a fair agreement

- ✓ **Support for vulnerable countries**
- ✓ **Goal of mobilising $100bn per year extended to 2025, new goal to be set before 2025 widening the donor base**
- ✓ **Capacity building and technology transfer for developing countries; support for monitoring, reporting and verification**
- ✓ **Adaptation at political par; Loss and Damage for the first time part of an international agreement**

"Today we celebrate, tomorrow we have to act" Commissioner Cañete, 12 December 2015

Next steps:

- **High-level signatory ceremony in April 2016**
- **Crucial implementing details to be worked out in coming years**
- **Stepping-up pre-2020 action**

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What next – *the International agenda*
The Paris Implementation Cycle

- **April 2016: Signing of Paris Agreement, New York**
  - ***Ratification, entry into force?***
- **2018: *Facilitative dialogue*: assessment of need for further global action, based on past performance and IPCC Special Report**
- **2020: Update: *communicate or update existing NDC* & submission of first mid-century emission reduction strategy**
- **2023: Global stocktake**
- **2025: Update NDC**

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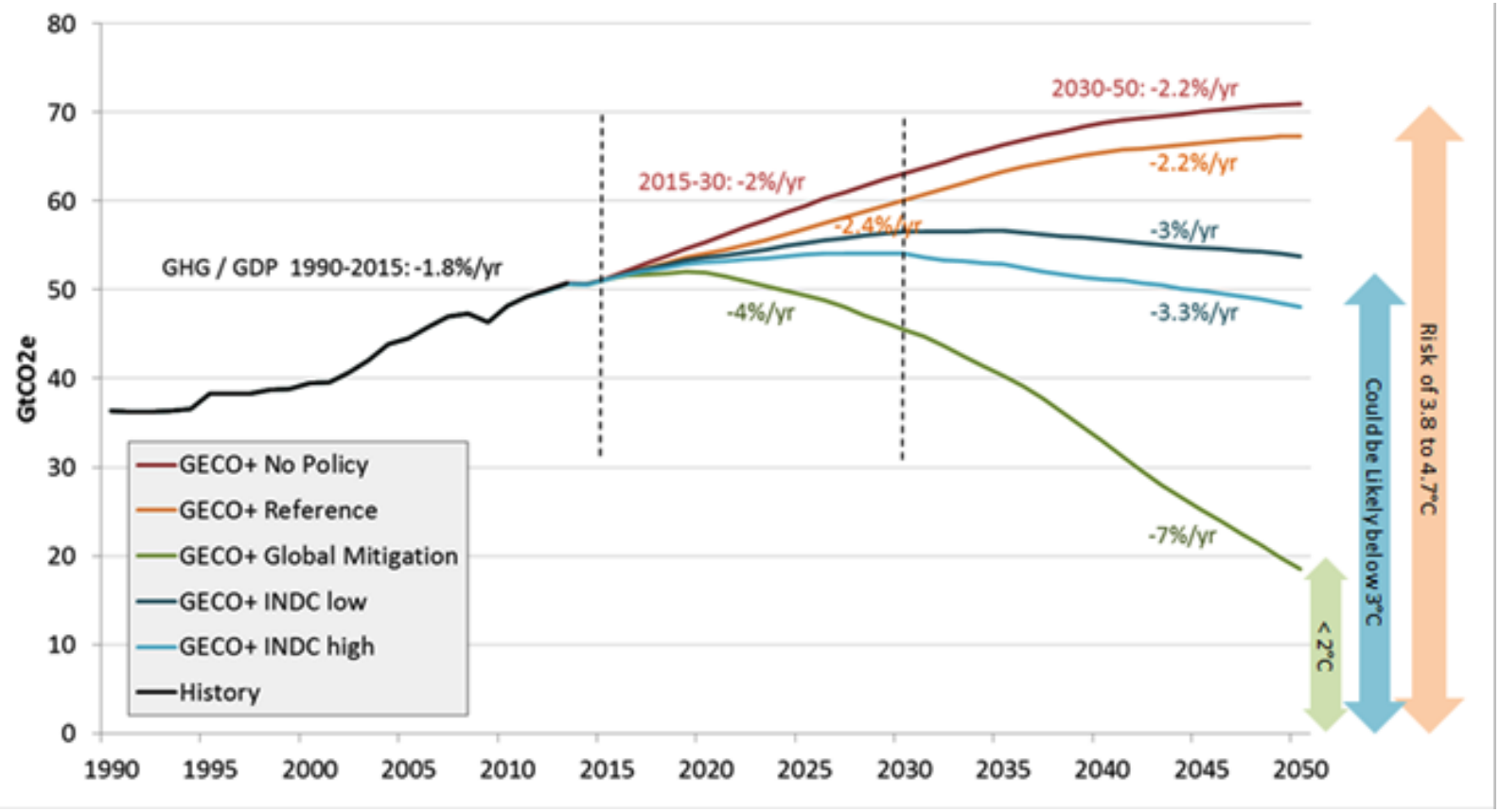
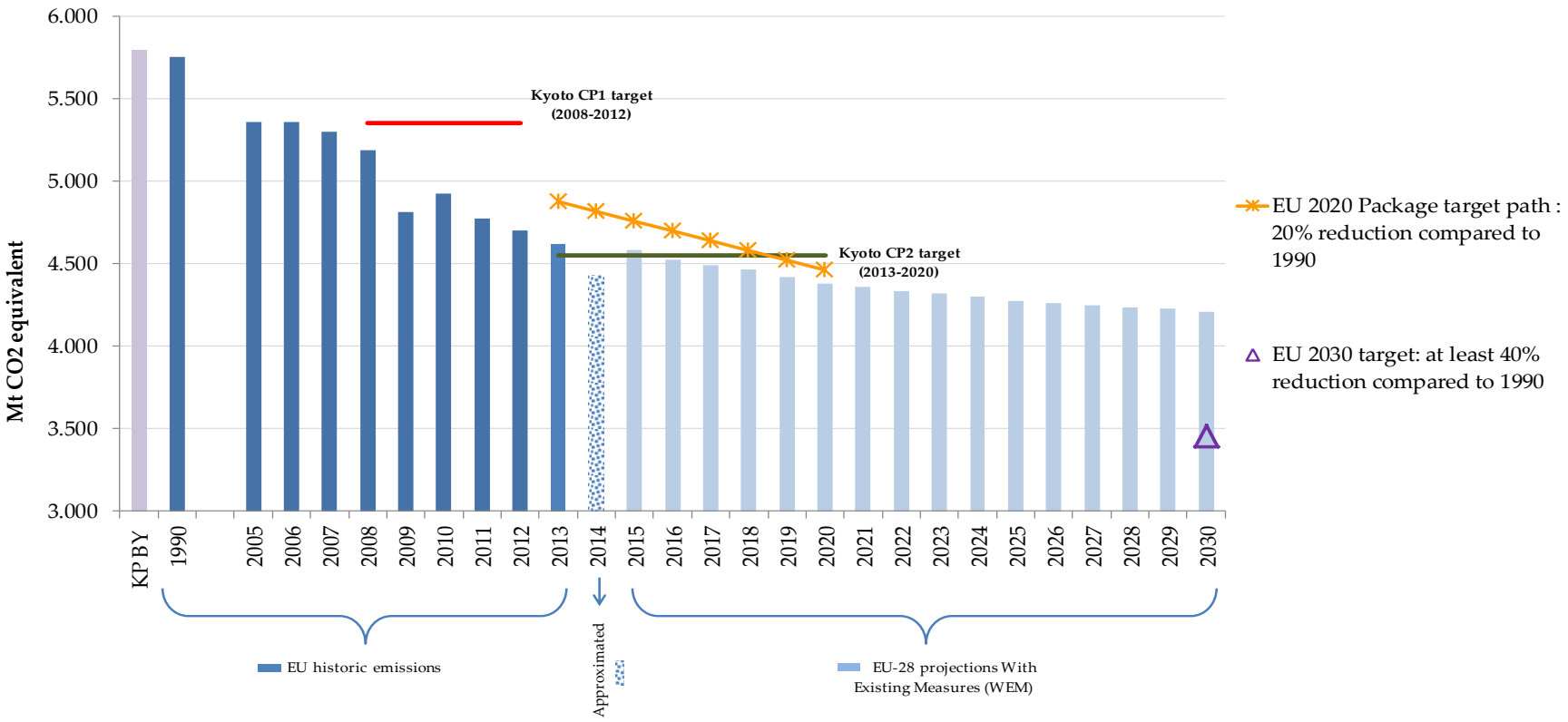
Impact of INDCs on global emissions

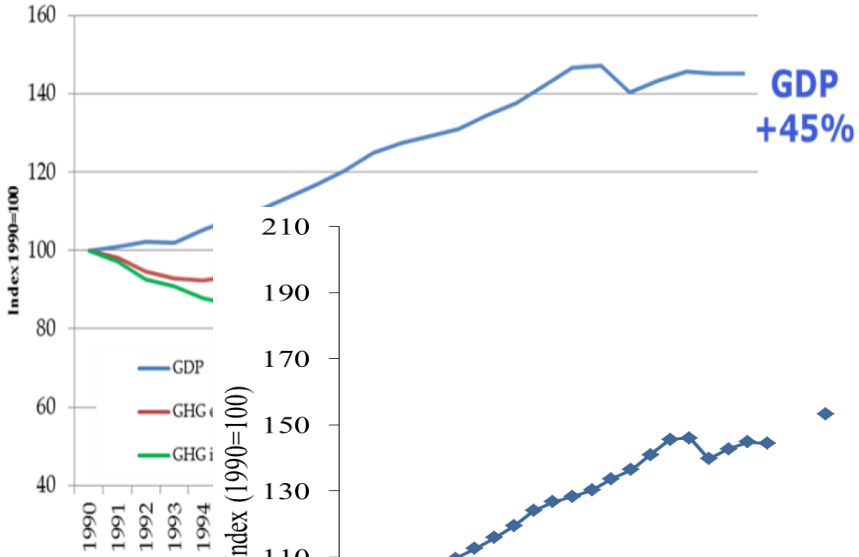


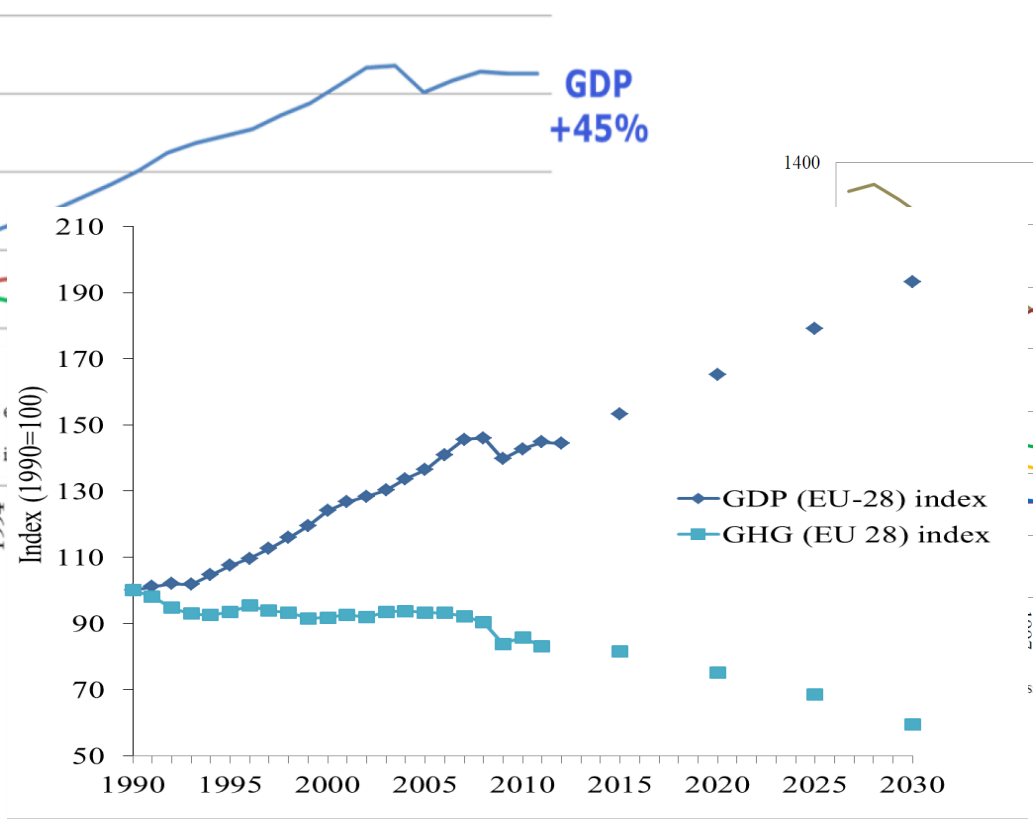
Source: EC-JRC

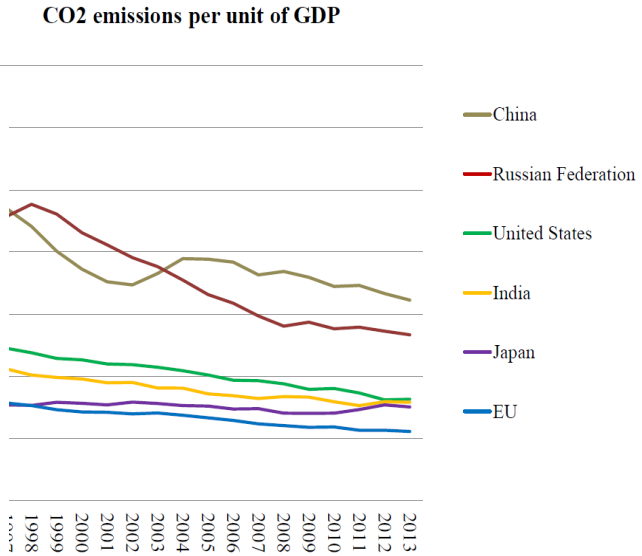
Climate Action Progress Report (COM/2015/576)



EU's policies show climate action and growth can go hand-in-hand



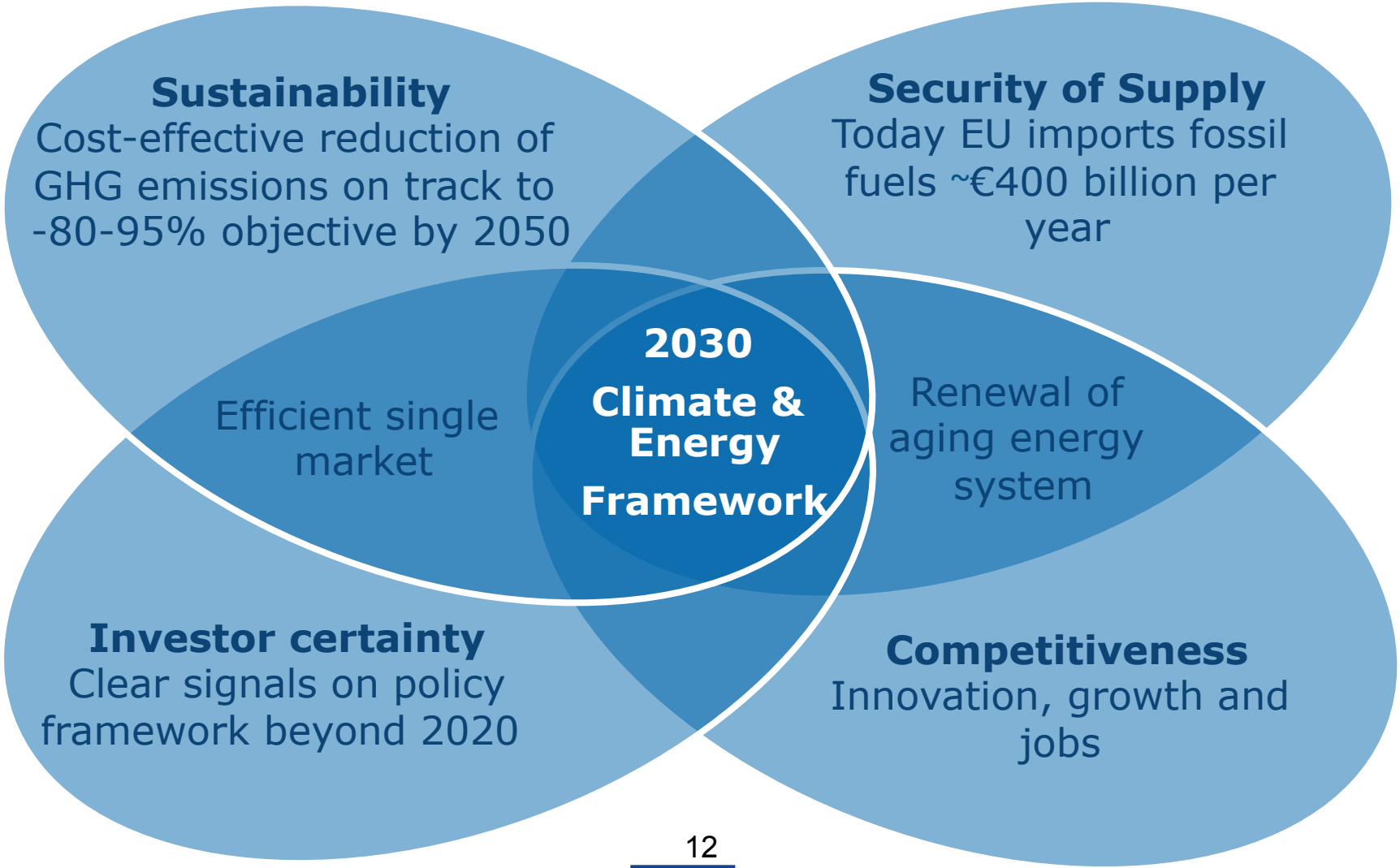




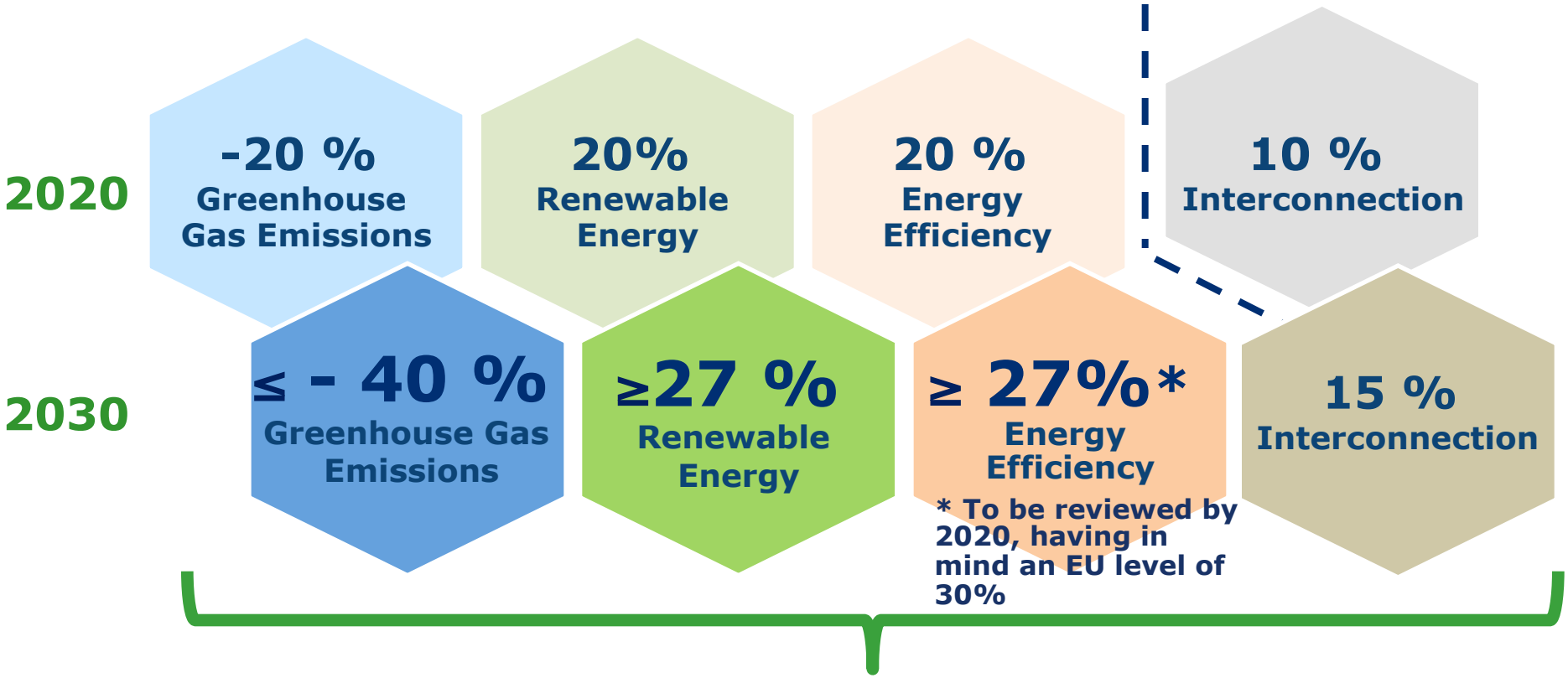
ssil-fuel use and cement production, trends in global CO2 emissions, 2014 Report, PBL, JRC

What next – *the domestic agenda*
Balancing the five dimensions of the Energy Union

1. Energy security, solidarity and trust
2. A fully integrated European energy market
3. Energy efficiency contributing to moderation of demand
4. *Decarbonising the economy*
5. Research, Innovation and Competitiveness


Sustainability
Cost-effective reduction of GHG emissions on track to -80-95% objective by 2050
Security of Supply
Today EU imports fossil fuels ~€400 billion per year
Efficient single market
2030 Climate & Energy Framework
Renewal of aging energy system
Investor certainty
Clear signals on policy framework beyond 2020
Competitiveness
Innovation, growth and jobs

2030 Framework for Climate and Energy



Commission proposals for the implementation of the EU's contribution

- **Emissions Trading System** — **2015**

- **Successor to Effort Sharing Decision**
- **LULUCF**
- **Communication on decarbonisation of transport**

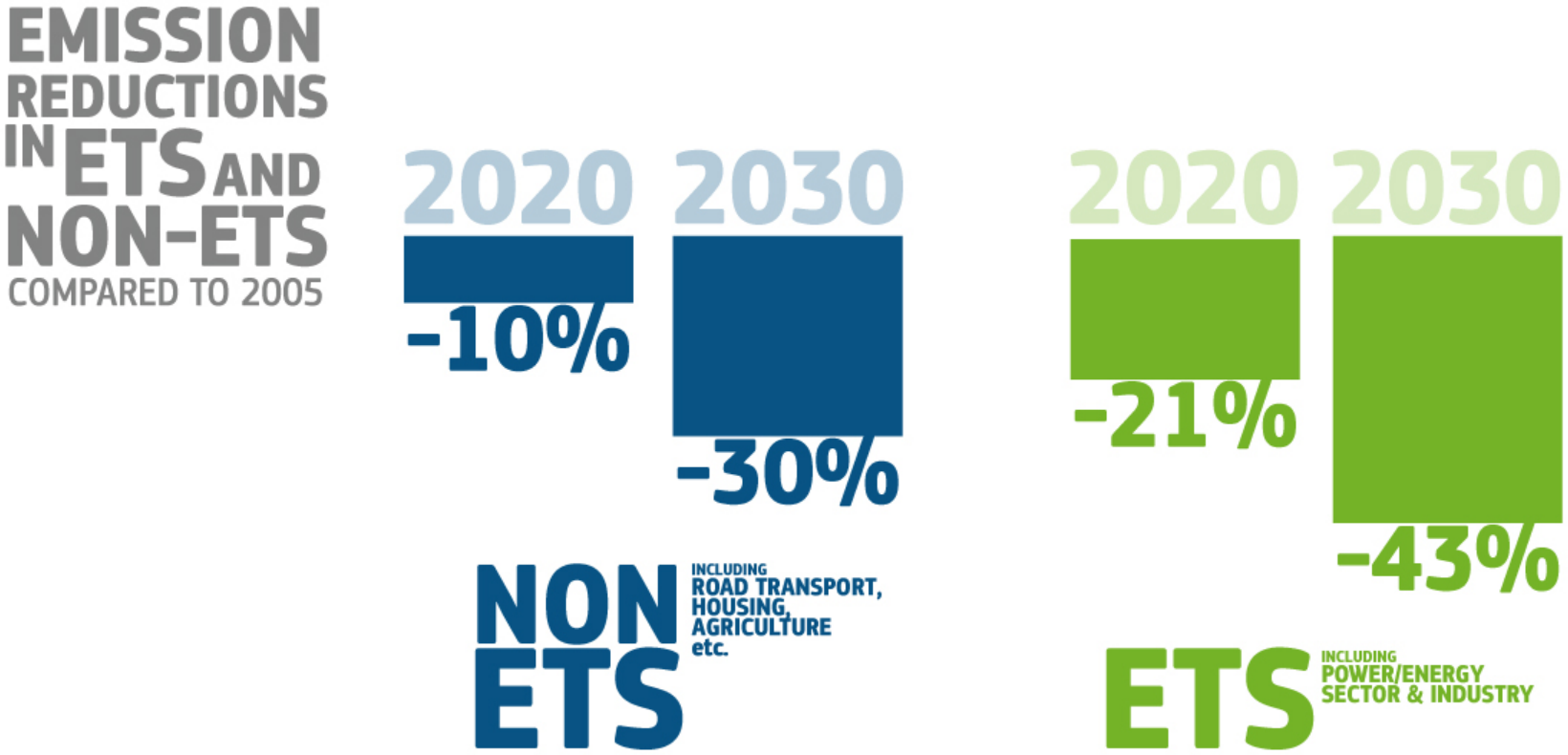
— ***1st half 2016***

- **Energy efficiency**
- **Electricity market design**
- **Renewables (including biomass, biofuels)**
- **Integrated climate and energy governance**

— ***2nd half 2016***

European Commission

Emission reductions in ETS and non-ETS

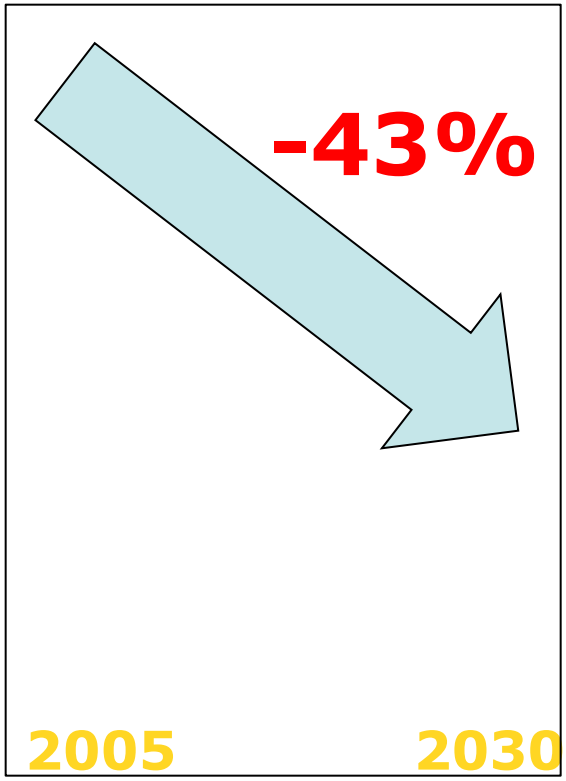


Key elements of the reformed EU ETS

- ***Market Stability Reserve (MSR) as from 2019***
- ***ETS revision for post-2020 period***

- **Better targeted free allocation for industry**

- **Transitional free allocation to power sector in lower income Member States**



EU ETS – auction revenues, 2020-2030

- **EU Member States should use 50% of their ETS auction revenues for climate-related purposes**

  ⇨ ***more than 6bn allowances in total to be auctioned***

- **Innovation Fund for low-carbon innovation**

  450 mio allowances

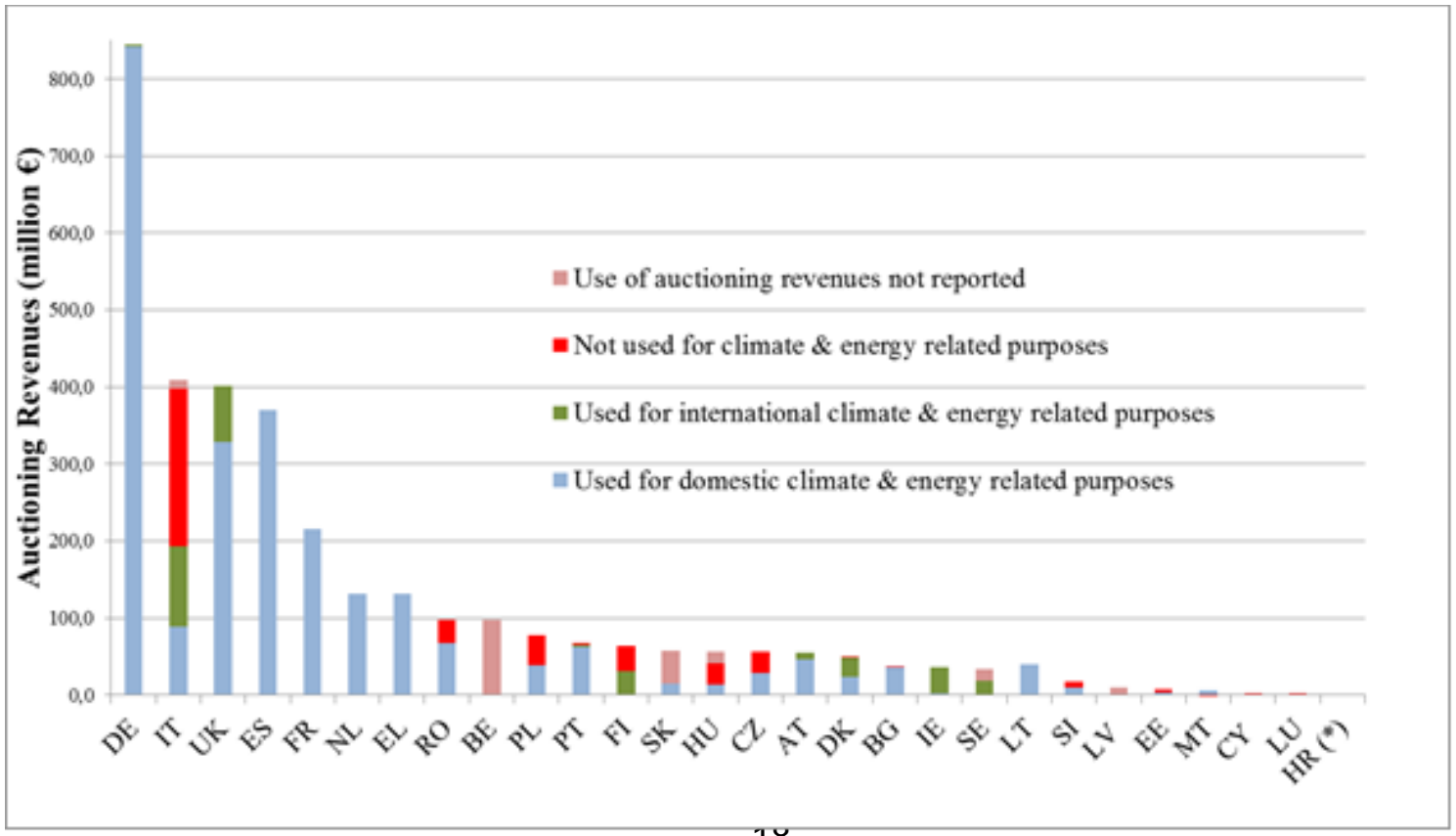
  ⇨

- **Modernisation Fund for energy investments in low-income Member States**

  310 mio allowances

  ⇨

Use of revenue from the auctioning of EU ETS allowances: the polluter pays principle



So what role for CCS?

Legal framework

- ✓ *ETS Directive*
- ✓ *CCS Directive*

The CCS Directive

- ✓ *Part of the 2009 climate and energy package*
- ✓ *2008 Eu Council: up to 12 CCS demo plants by 2015*
- ✓ *Legal framework for the environmentally safe geological storage of CO_2*
- ✓ *To ensure high level of protection of the environmental and human health from the risks posed by the geological storage of CO_2*
- ✓ *To address public concerns*

The CCS Directive (cont.)

- *Site selection*
- *Exploration permits*
- *Characterisation and assessment*
- *Storage permits*
- *Monitoring*
- *Corrective measures*
- *Closure and post-closure*
- *Financial security*
- *Transfer of responsibility*

Review of the CCS Directive

- Article 38 requires a review report by March 2015
- Is Directive fit-for-purpose? – part of the REFIT programme to assess effectiveness, relevance, efficiency, coherence and EU-added value of EU law

Evaluation study by consultants

- Triple-E Consulting, Ricardo-AEA and TNO
- Geographic scope: European Economic Area
- Method: Literature review and case studies, on-line consultation, interviews, focus groups, 2 stakeholder meetings
- Goal: Retrospective assessment and possible improvements to the current legal and policy framework and/or its application by the national authorities and industry
- Timeline: April – December 2014

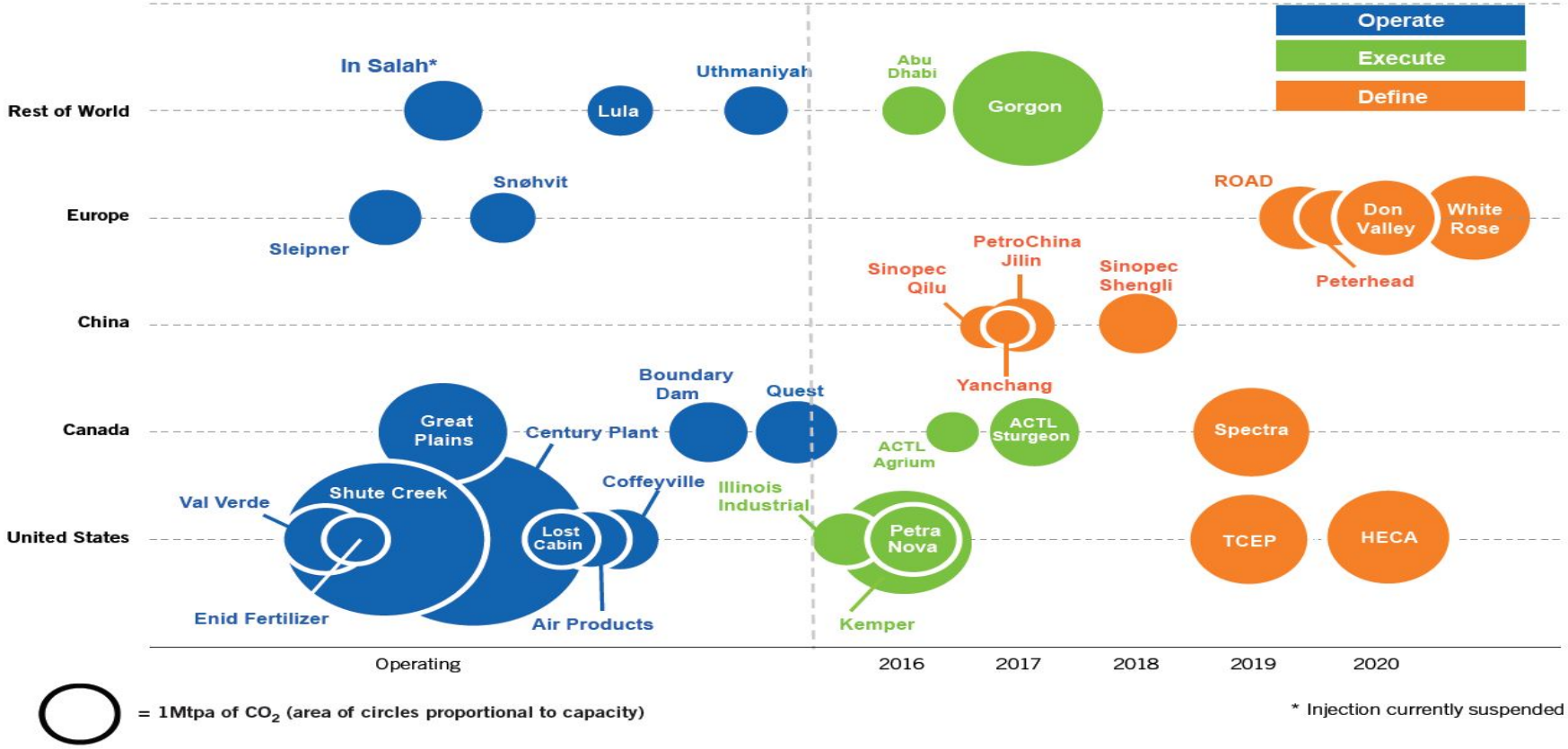
➢ Study available in EU Bookshop

Methodological limitations

- Limited experience with application of the Directive
  - **ROAD – the only project with practical experience with permitting CO_2 storage** at time of the review
  - **The operational European examples either started before the CCS Directive or are below the 100kt of CO_2 stored threshold for R&D projects**

CCS State of play

Figure 1.4 Actual and expected operation dates for large-scale CCS projects in the Operate, Execute and Define stages by region and project lifecycle stage



Source: GCCSI

Permanence of storage

- Not sufficient practical experience yet
- Results from R&D storage sites and from projects in other countries indicate safe and long-time storage is possible

Need for Commission review

- ✓ *Draft storage permits*
  - **Does not significantly prolong the time needed to obtain a permit**
  - **Some stakeholders concerns with application of Article 19 on financial security and the related guidance document but the Article provides high level of flexibility for adjustments depending on the particular case**
- ✓ *Draft decisions on transfer of responsibility*
  - **No evidence**

No particular issues found and too early to amend existing requirements

- Storage site assessment criteria (Annex I) generally viewed as acceptable
- CO_2 stream acceptance criteria
- Criteria for site monitoring plans (Annex II) are workable
- Transfer of responsibility
- Third party access (Articles 21&22)
- Trans-boundary issues (Article 24)
- Need for further regulation on transport

Article 33: Readiness to retrofit for CO_2 capture, transport and storage

- Data from MS consenting process is readily-available only for UK
- In UK and FR: all new power plants have to be ready for retrofit
- UK: a guidance note what plant developers should consider and demonstrate in their CCS retrofit checks
  - **A study on CCSR: Jan – July 2016**

Incentives to apply CCS to installations combusting biomass

- Challenges associated with deploying CO_2 capture to biomass installations: not significantly different
- There are currently no specific incentives in Europe to apply CCS to installations combusting biomass

Emission performance standards (EPS)

- *2011 study: the implementation of EPS from 2020 would not provide additional incentives for CCS deployment*
- *The 2030 climate and energy framework, the ongoing reform of the EU ETS and the market stability reserve expected to substantially boost the investment climate for low-carbon technologies over time*
  - **EPS: neither necessary nor practicable**

Conclusions on the Directive

- **The Directive is fit-for-purpose:** provides the regulatory framework needed to ensure safe CO_2 capture, transport and storage while allowing the Member States sufficient flexibility
- **Robust judgement** of the performance of the Directive **was not possible** due to lack of practical experience
- **Stakeholders concerned that reopening** the Directive would bring a period of uncertainty for CCS when investor confidence is already low

REFIT evaluation conclusions

- **Effectiveness and efficiency:** insufficient evidence to judge the effects e.g. on *legal certainty, ensuring the installations are safe for the environment and human health and cost of implementation*
- **Relevance**: need for action to reduce emissions remains high and urgent; focus on the key issues required for a common approach
- **Coherence:** CCS Directive is internally coherent and aligned with the overall climate and energy framework
- **EU-added value**: a good balance between the Directive defining an overall framework while MSs then developing their own detailed and case / site specific interpretation

Next CCS report

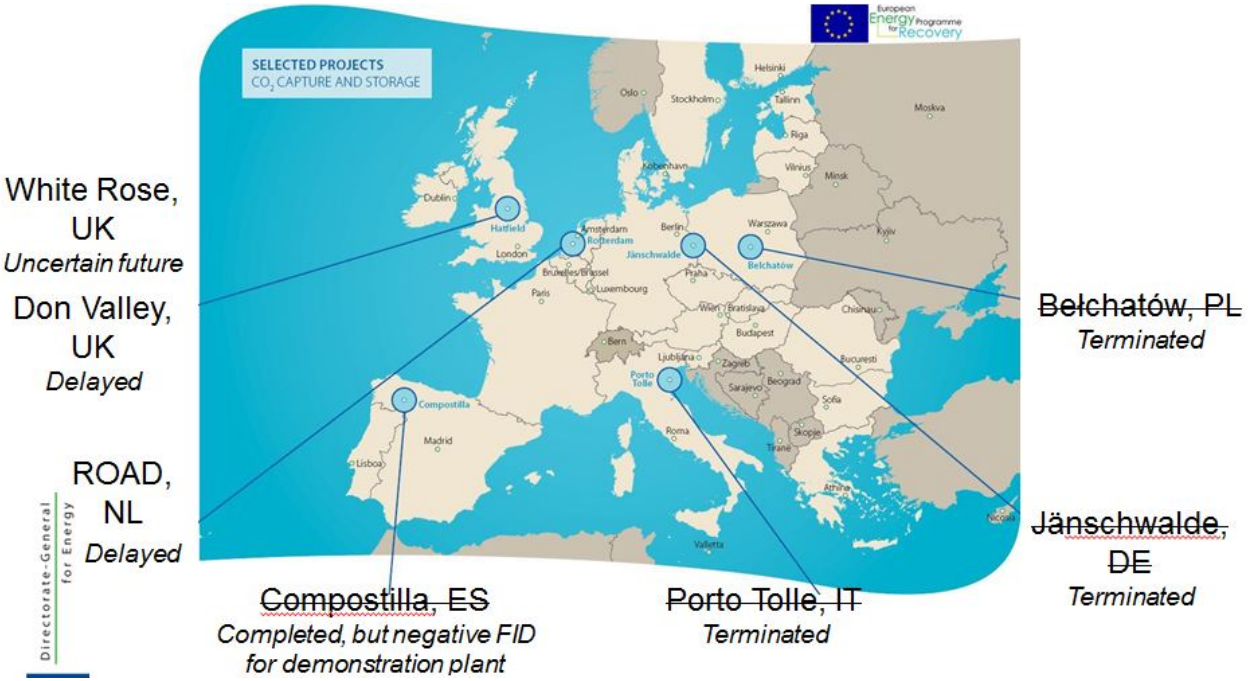
- Member States are to report to the Commission on implementation of the CCS Directive every three years (by *April 2016)*
- Commission has to issue a report on the implementation within 9 months
- Questions to MS on exploration and storage permits, assessment of CO_2 storage and demining storage sites, CCS readiness, CCS in MS climate and energy plans, support to CCS (research, structural funds, etc.), transport infrastructure, hubs and clusters, transboundary cooperation

CCS in Europe

- CCS appears to be cost competitive with other medium to long term options for decarbonising the power supply, while not all MS are considering the role of CCS in their long-term decarbonisation plans
- The carbon price has not been high or stable enough to give sufficient confidence to start CCS investments
- NER 300 and the EEPR have attracted bids, but have not offered high enough levels of support to make up for the funding gap
- Only one MS, the UK, has a targeted programme to support CCS deployment
- Research support and work have advanced knowledge and understanding of costs, performance and technical feasibility
- Europe is well behind and no longer leading
- Transport and storage need to be addressed – for example via a process of source clustering and the consideration of pipeline networks

Conclusions on the enabling policy

- Support for commercial-scale demonstration projects both in the power and industry sectors should continue at both EU (Innovation fund) and national level (public and private)



Conclusions on the enabling policy (cont.)

- Stepping up research and innovation activities: SET-Plan and Horizon 2020, including on industrial CCS and CCU
- Member States to consider CCS as part of their long-term planning: Governance for the Energy Union
- Plan and share CO_2 transport and storage infrastructure (PCIs: Connecting Europe Facility)

TEN-E Guidelines: CO_2 cross border networks

- *Priority thematic area for cross border CO_2 networks in the TEN-E Guidelines*
  - *Development of CO_2 transport infrastructure between Member States and with neighbouring third countries in view of the deployment of CCS*
- *Goal: contribution to the achievement of Union's climate and energy policy objectives (in the longer term towards 2050)*
- *PCI in CO_2 transport infrastructures eligible for CEF funds; permit granting provisions apply*

Recent work

- *Analysis of the legal and regulatory frameworks at Member States level*
- *Thematic Group in October 2015 within the TEN-E Thematic Group*
- *Study of process and criteria for selection of CO_2 PCIs – to match state of play of CCS projects in Europe*

CO2 PCI projects- Criteria

General criteria

- *Contributes to the implementation of the infrastructure priorities*
- *Economic, social and environmental viability*
- *Involves at least two Member States:*
  - **Cross-border infrastructures**
  - **Infrastructure with significant cross-border impact**

Specific criteria

- **Avoidance of CO_2 emissions while maintaining security of supply**
- **Increasing resilience of CO_2 transport**
- **Efficient use of resources**

→ *Cost-benefit analysis*

+ urgency, number of MS, complementarity and territorial cohesion

Next steps of the Thematic Group

- *Supporting potential PCI projects to come forward in future PCI lists (new list as from 2017)*
- *Detailed CBA analysis*
- *Support infrastructure planning in specific regions (e.g. North Sea)*

Reasons for lack of progress in EU

Condition	OK?	Comments:
1) Legislative Framework	Yes (?)	Storage enabled by CCS Directive, but Member States can restrict storage
2) Successful Demonstration	-	Worldwide 15 large-scale projects operating, but none in the EU
3) Commercial Viability	No	ETS price low, no support schemes at Member State level
4) Public Acceptance	-	Challenges particularly with onshore storage
5) Infrastructure	Yes (?)	Potentially Project of Common Interest (PCI), but additional funding needed
6) Innovation	Yes	Horizon 2020, Strategic Energy Technology Plan (SET-Plan)

More information

EU Climate Action website

http://ec.europa.eu/clima/policies/lowcarbon/ccs

Review report

http://ec.europa.eu/clima/policies/lowcarbon/ccs/directive/index_en.htm

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Thank you for your attention!

Climate Action