

# Energy policy of CZ and the role of CCS/CCU

CO<sub>2</sub> spicer project launch event

*Thursday 12 November 2020, 14:55-15:05*



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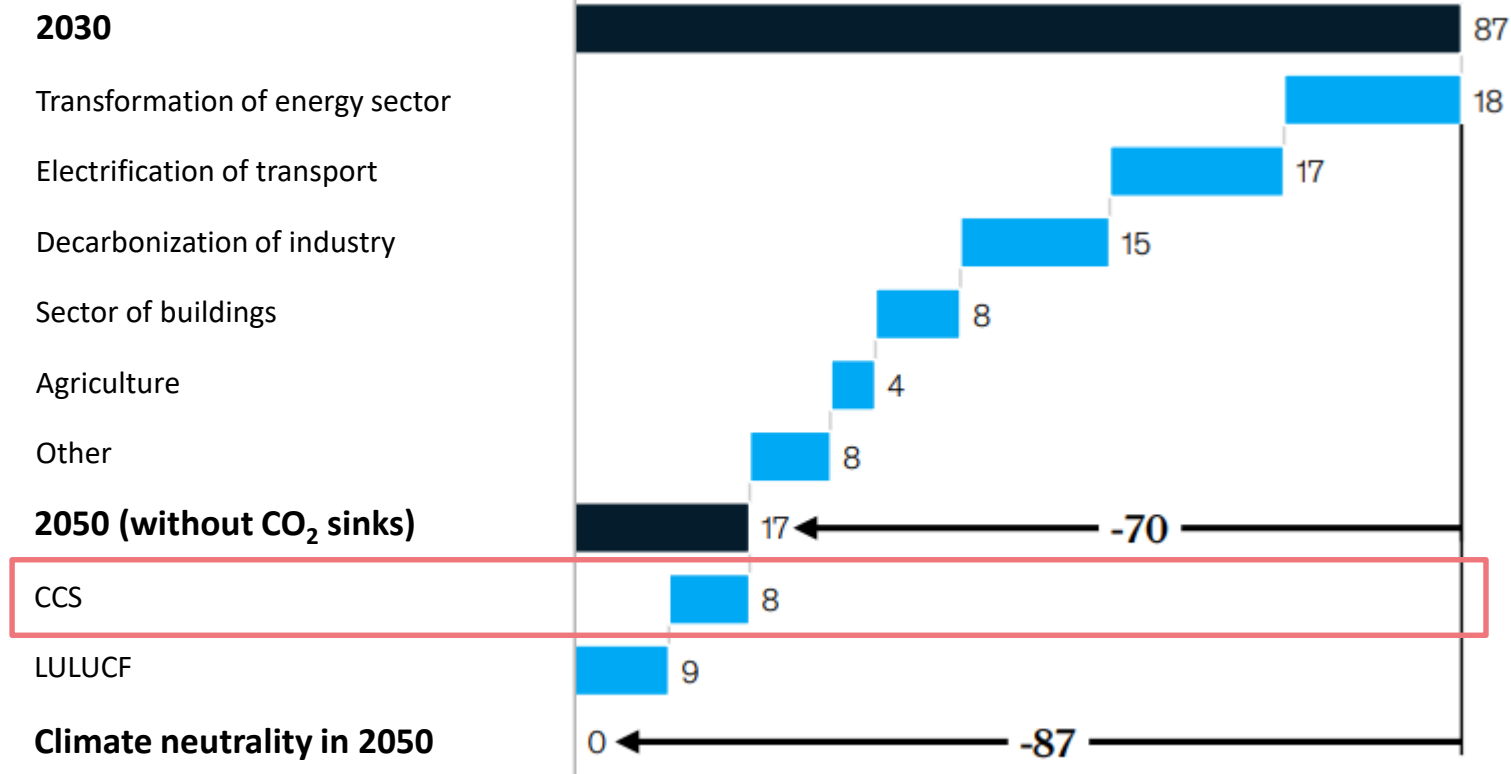
# Energy policy of CZ and the role of CCS/CCU

- ➔ In 2020 the **assessment of State energy policy (2015)** was prepared – recommendation to update the policy **taking into account climate neutrality commitment and development of key technologies.**
- ▶ Expected **clarification of the role of CCS** (especially beyond 2030)?
- ➔ **Role of CCS in energy sector is fairly limited** due to expected phase-out of coal (role of CCS in combination of natural gas?)
- ➔ The role of **CCS would be probably essential for decarbonization of industry** (especially EII).



# Energy policy of CZ and the role of CCS/CCU

Potential measures for the reaching the climate neutrality by the year 2050 (Mt CO<sub>2</sub>eq.)



Source: Klimaticky neutrální Česko (McKinsey & Company) ([link](#))

# Energy policy of CZ and the role of CCS/CCU

Potential measures for the reaching the goals of 55 % GHG reduction by 2030 (Mt CO<sub>2</sub>eq.)

**2017 (base year)**

Transformation of energy sector

Coal extraction and processing

Transport sector

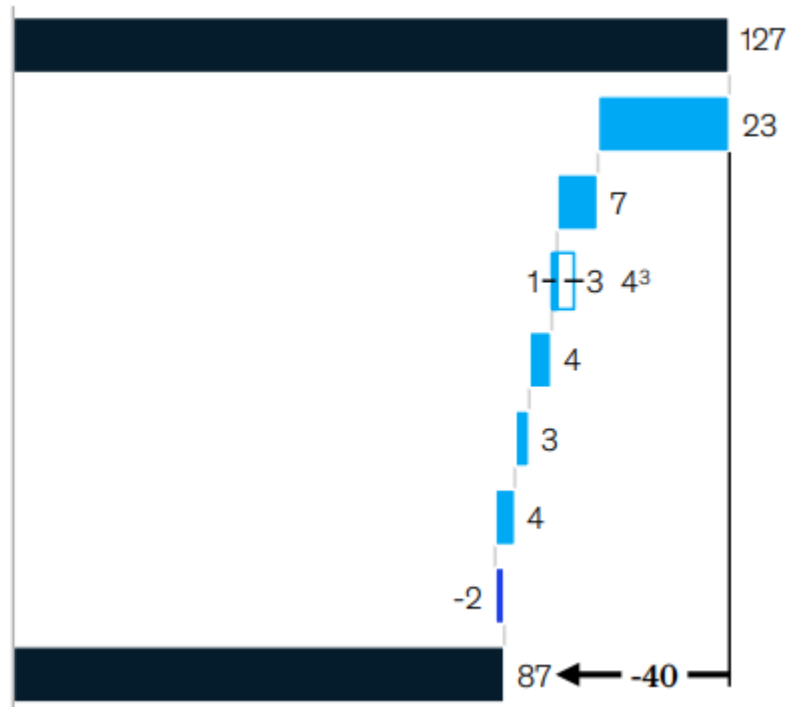
Sector of buildings

Electrification of industry

Other decarbonization measures

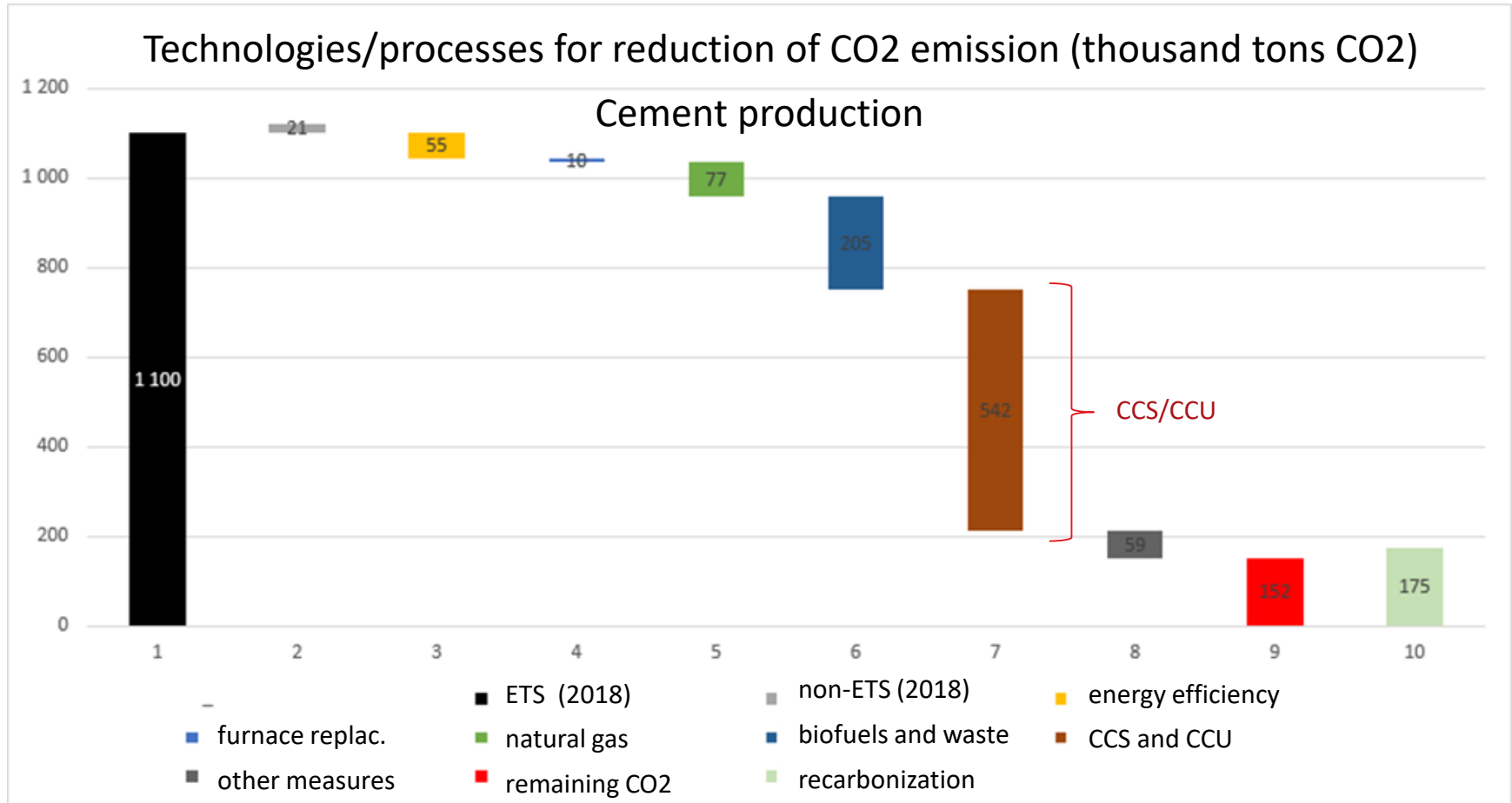
LULUCF (increase due to bark beetle calamity)

**2030**



Source: Klimaticky neutrální Česko (McKinsey & Company) ([link](#))

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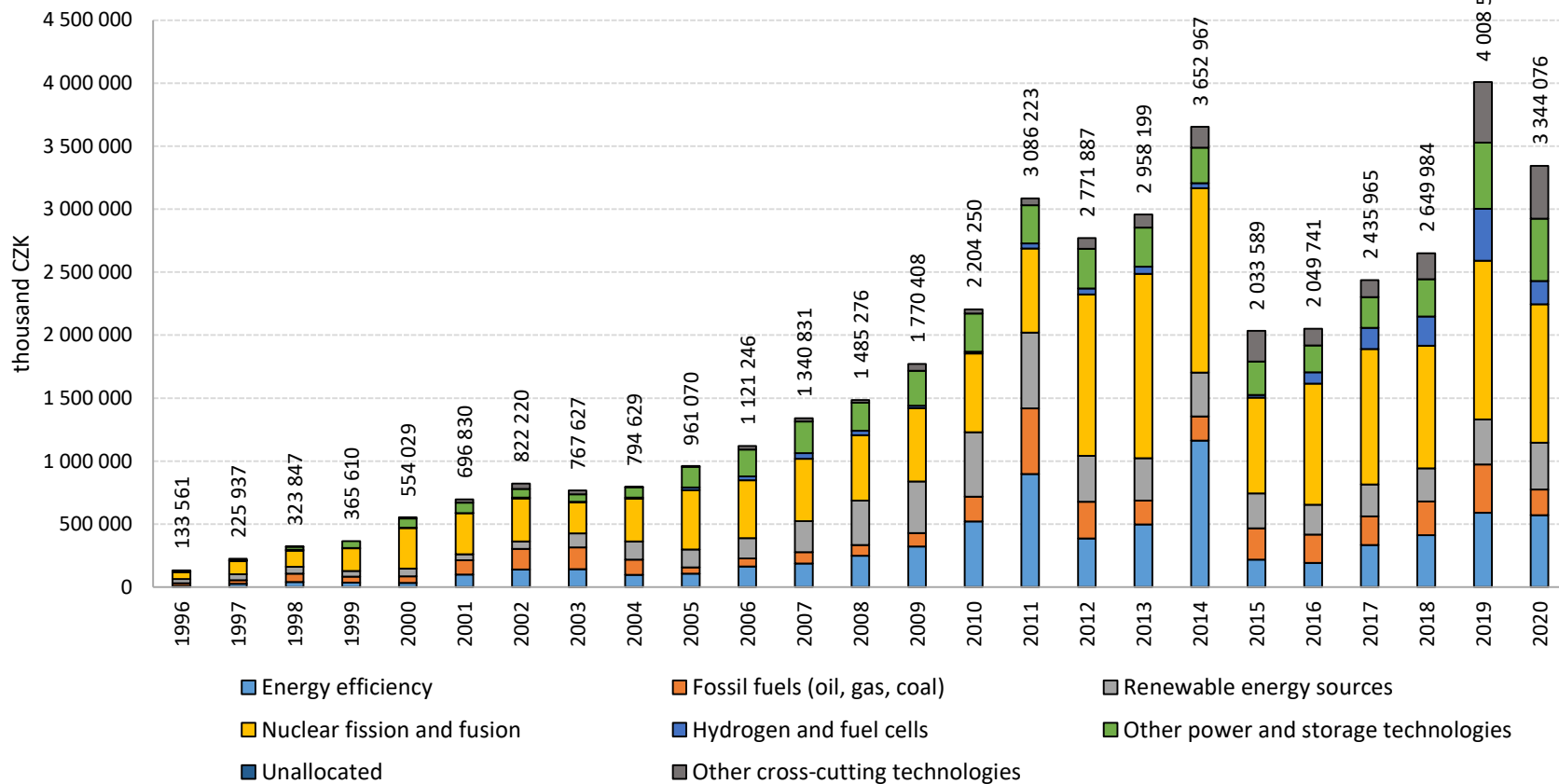
# Sources of potential financing

- ➔ **National funding for applied research** – program THÉTA 2018-2025 (initiation of follow-up program)
- ➔ **Norway funds** – program KAPPA
- ➔ **EU projects** (FP6, FP7, H2020 etc.)
- ➔ **Modernization Fund**
- ➔ **Innovation Fund**
- ➔ **Just Transition Fund** – focused on three coal regions; bottom-up approach



# Statistics of R&D expenditures

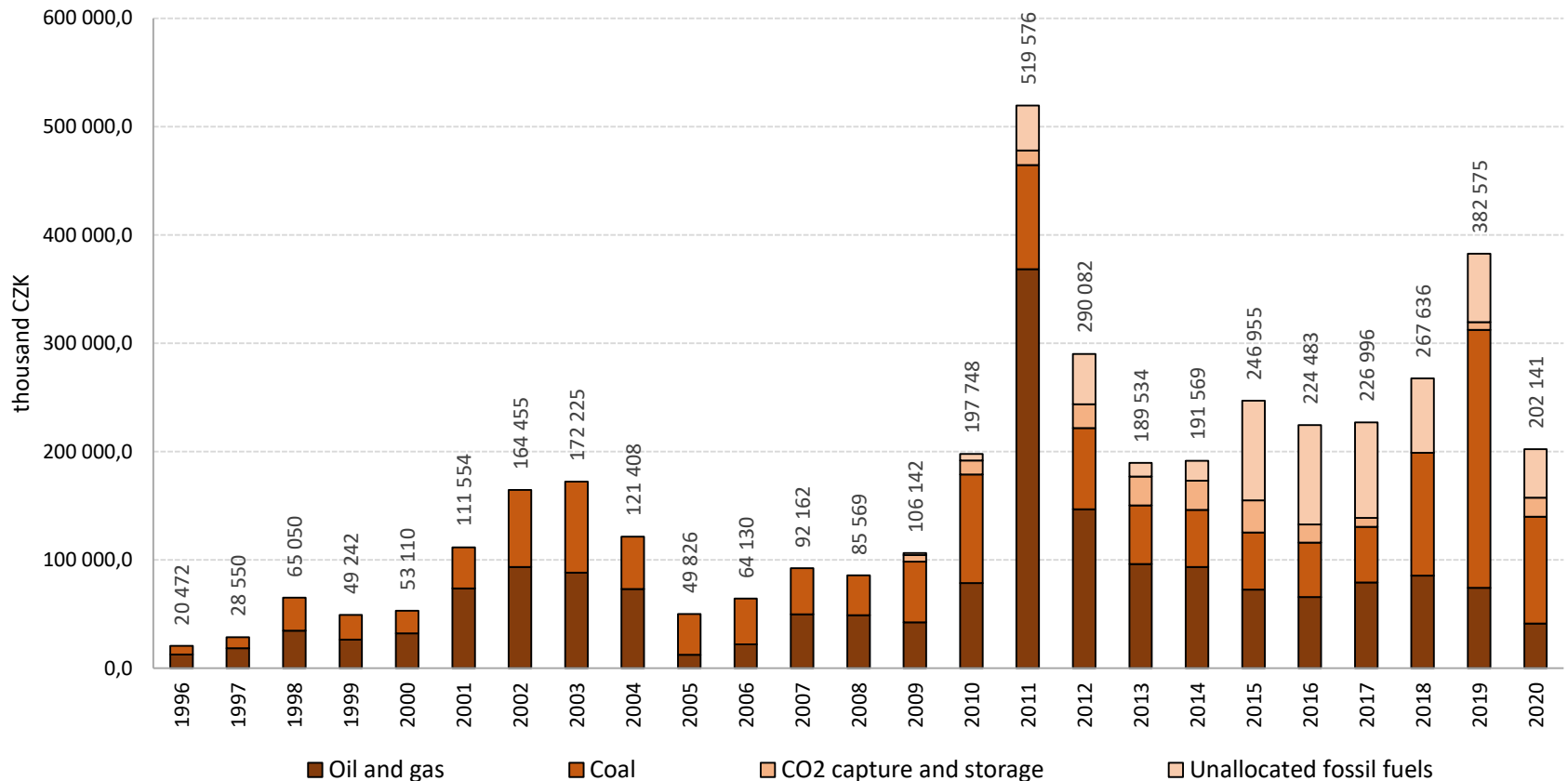
Estimate of expenditures for R&D in the period 1996-2020



Source: Statistics on R&D expenditure in the field of energy for the purpose of IEA questionnaire ([link](#))

# Statistics of R&D expenditures

Estimate of expenditures for R&D in the period 1996-2020 (fossil fuel category)



Source: Statistics on R&D expenditure in the field of energy for the purpose of IEA questionnaire ([link](#))



# Investment Fund

Overall application per country



Application per country (CCS/CCU proj.)



Source: Statistics of the proposal received for the large-scale of the Innovation Fund in October 2020

# Energy Union and SET Plan

- ➔ the **Energy Union (EnU)** was founded in 2014
- ➔ EnU has a basic 5 dimensions / areas: GHG, EE, IEM, SoS, R&D
- ➔ Priorities of EnU:
  - ▶ Leadership in the field of RES
  - ▶ Energy efficiency
  - ▶ Sustainable transport
  - ▶ **CCU/CCS (Carbon Capture and Use/Carbon Capture and Storage)**
  - ▶ Nuclear safety
- ➔ **The Strategic Energy Technology Plan (SET Plan)** as part of the **Energy Union** strategy is at the forefront of European energy technology policy
- ➔ The integrated SET Plan identifies ten actions needed to accelerate the EU energy system transformation in a cost-effective way



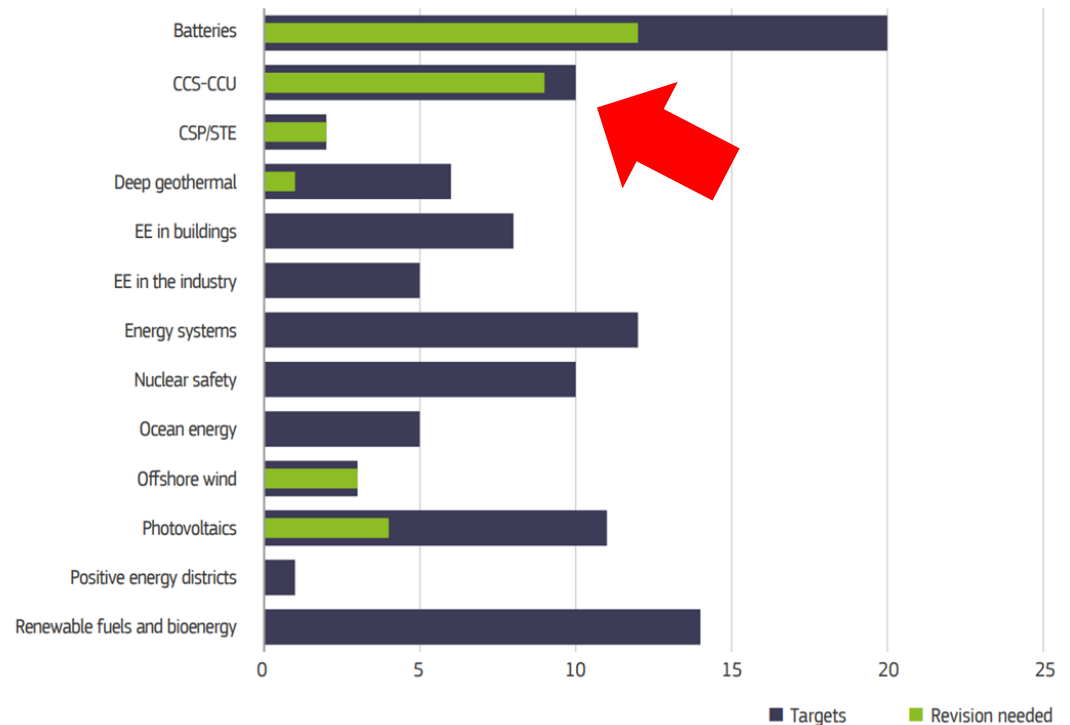
# SET Plan IWG9 – Implementation Working Group on CCS and CCU

- ➔ Membership - 11 Members States and Associated countries: **Czech Republic**, France, Germany, Hungary, Italy, Norway, the Netherlands, Turkey, Spain, Sweden and the UK; industrial stakeholders, non-governmental organisations and research institutions
- ➔ Task: to **advance the Implementation Plan** for CCS and CCU, reaching collectively the agreed technology targets; to monitor the progress of actions
- ➔ 8 key research & innovation activities and 10 targets defined in 2017



# SET Plan revision – relevance of the targets

- ➔ CCS-CCU is the SET Plan key action where the highest percentage of targets needs revision
- ➔ Many original targets set for 2020 have not been achieved



# SET Plan revision – new targets for 2030

- ➔ Delivery of **15 commercial-scale CCS projects linked to industrial CO2 sources** + 10 projects with completed FEED study and 5 with an investment decision
- ➔ Delivery of **10 commercial-scale CCS projects for clean, flexible power and heat generation** (including waste-to-energy plants)
- ➔ EU member states having completed national and regional CCS roadmaps **for the development of dedicated CO2 transport infrastructure**
- ➔ At least 10 additional EU **Projects of Common Interest (PCI)** for CO2 transport infrastructure, with a focus on **Central, Eastern, and Southern Europe**



# SET Plan revision – new targets for 2030

- ➔ European **CO2 storage atlas** (the only unchanged target)
- ➔ At least 3 **pilots of capture technologies at TRL 7-8 in different industrial applications, including one enabling low-emission hydrogen production**. At least 6 pilots of capture technologies at TRL 5-6, of which at least 2 pilots to test **climate positive solutions** such as Bio-CCS and direct air capture (DAC)
- ➔ An interim target of at least 6 **new CO2 storage sites** in preparation or operating (timing to be defined); further 9 sites to be appraised by 2030, in a range of geological settings, both onshore and offshore



# SET Plan revision – new targets for 2030

- ➔ Several demonstration **installations producing CO<sub>2</sub>-based fuels, chemicals and materials** at the scale of tens of kt/a
- ➔ First **large-scale commercial installations** enabled by a supportive regulatory framework and risk-sharing financial measures at national and EU level including **Important Project of Common European interest (IPCEI)**
- ➔ All European countries having identified, if applicable, the **need for CCS/CCU as part of their strategy (producing a national CCS roadmap)** for their transition towards net-zero by 2050 (included in their National Energy and Climate Plans)



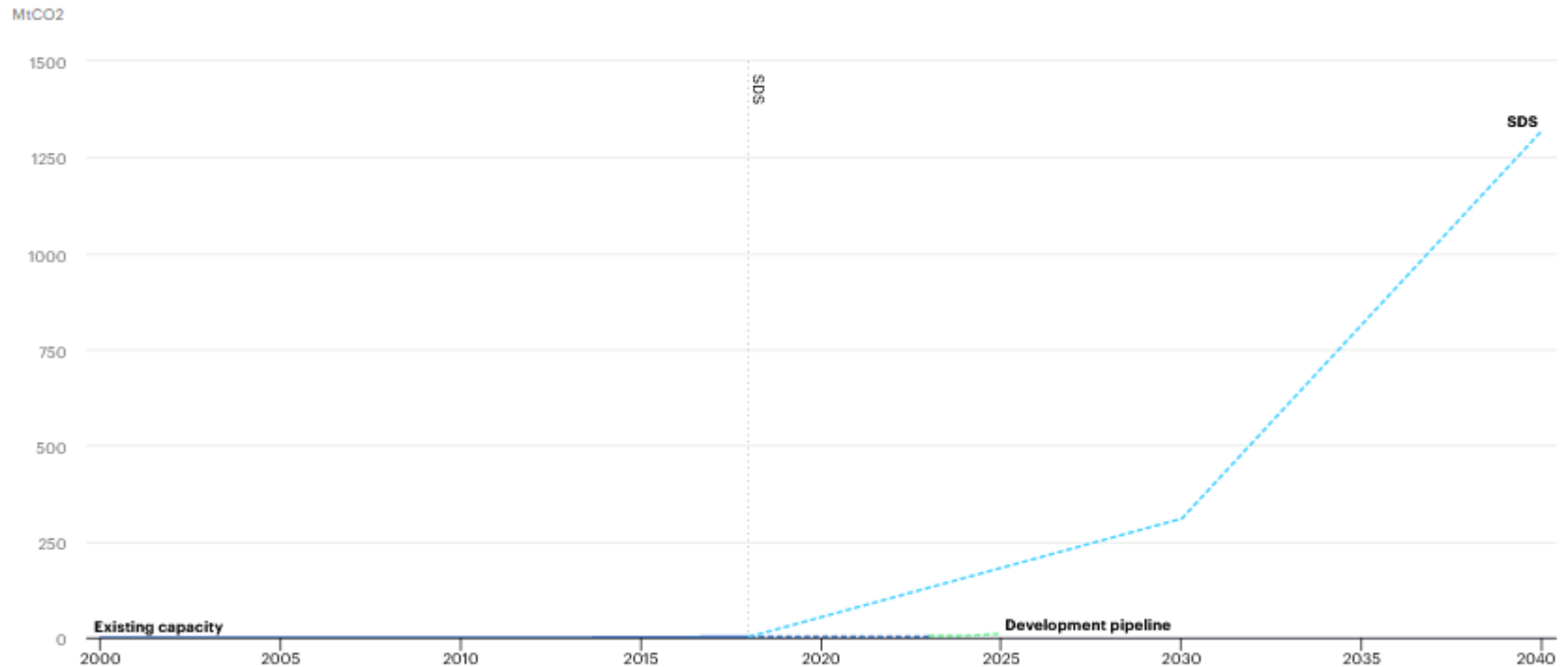
# International Energy Agency

- ➔ International Energy Agency (IEA): flagship report in 2020 „**CCUS in Clean Energy Transitions**“ as part of „**Energy Technology Perspectives 2020**“
- ➔ Projects at advanced stages of planning represent a total estimated investment of more than USD 27 billion, almost double the investment in projects commissioned since 2010
- ➔ **CCS/CCS related Technology Collaboration Program (TCP)** - Clean Coal Centre TCP (CCC TCP); TCP on Greenhouse Gas R&D (GHG TCP) and TCP on Bioenergy (Bioenergy TCP)
- ➔ **CZ participation in TCP** - TCP on Energy in Buildings and Communities, TCP on Clean Energy Education and Empowerment, TCP on Fluidized Bed Conversion, TCP on Energy Storage (currently in the process of joining this TCP)



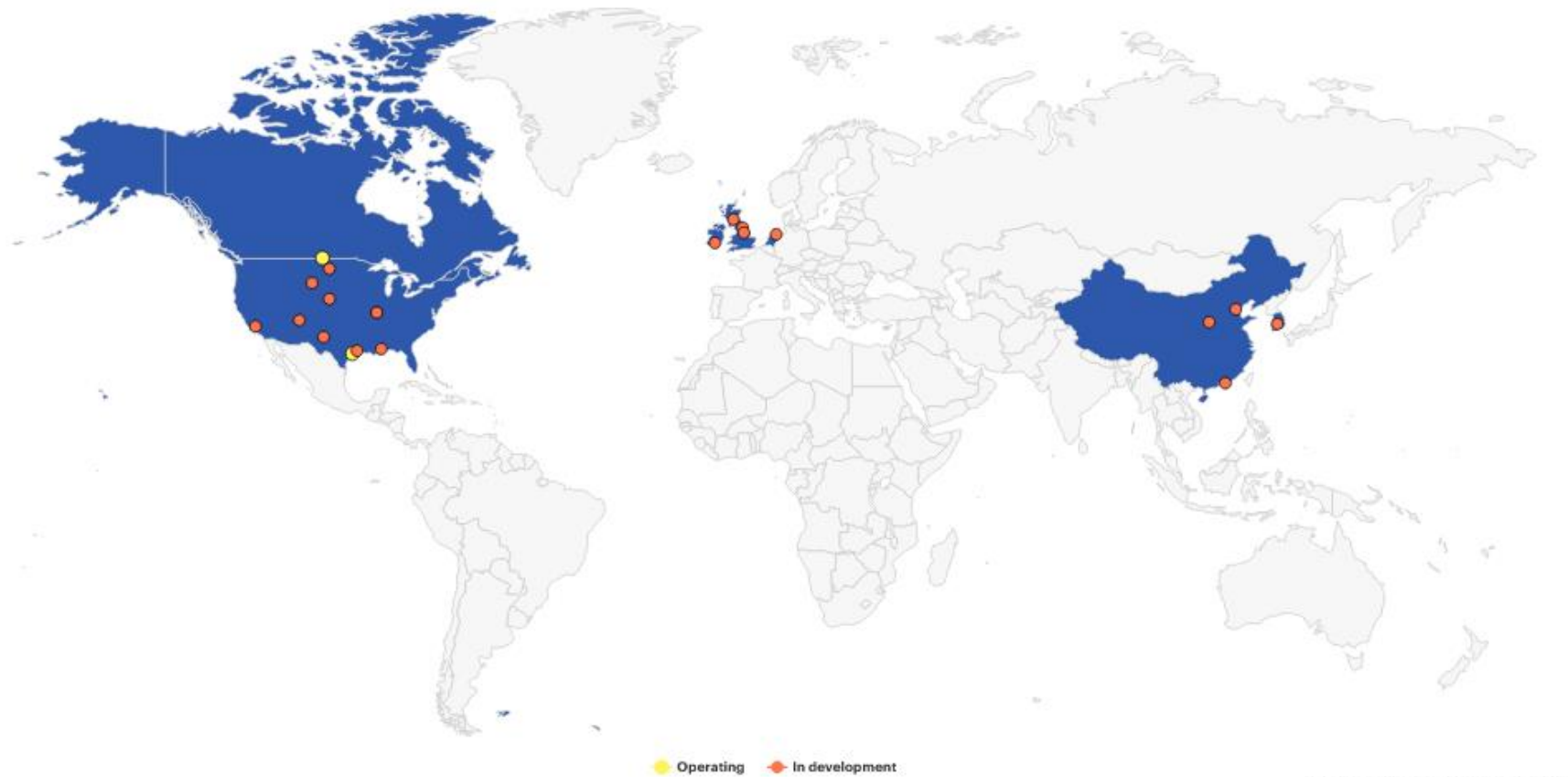
# Tracking Clean Energy Progress (IEA)

Large-scale CO2 capture projects in power generation in the Sustainable Development Scenario, 2000-2040



Source: TCEP IEA ([link](#))

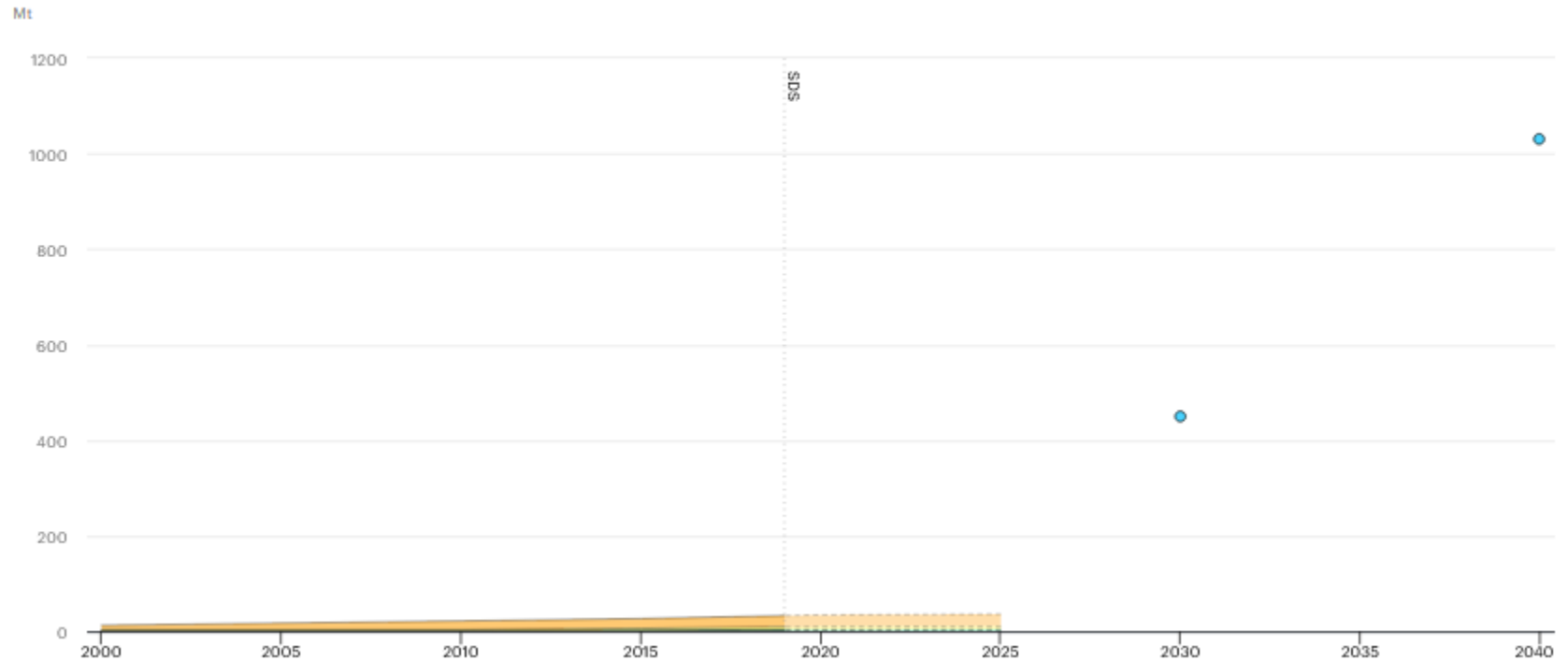
# Tracking Clean Energy Progress (IEA)



Source: TCEP IEA ([link](#))

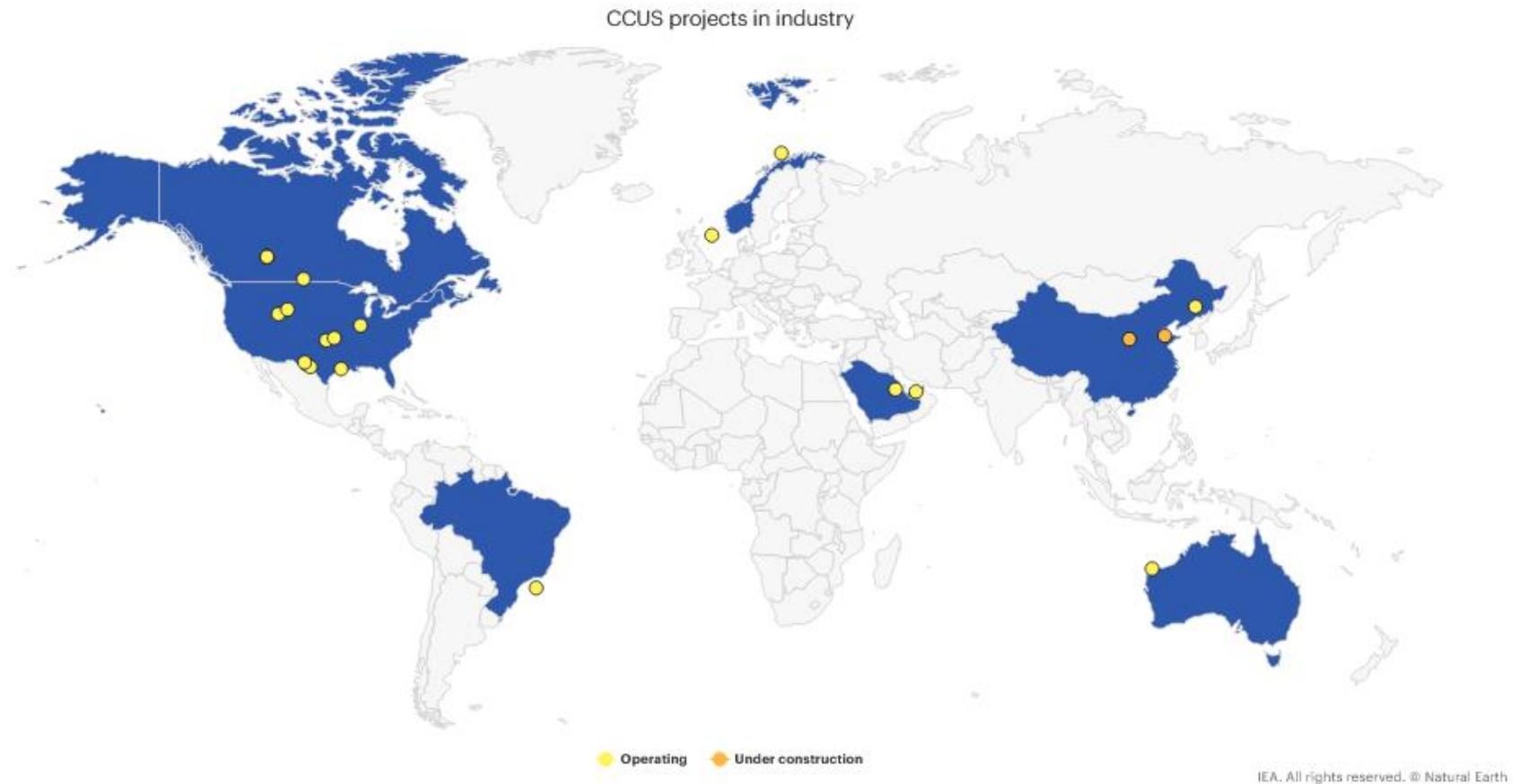
# Tracking Clean Energy Progress (IEA)

Large-scale CCUS projects in industry and transformation in the Sustainable Development Scenario, 2000-2040



Source: TCEP IEA ([link](#))

# Tracking Clean Energy Progress (IEA)



Source: TCEP IEA ([link](#))

# Horizon Europe and European Partnerships

- ➔ **EU concept:** transformation of EU instruments for international cooperation from pillars H2020 II. and III. at the EP (public/public + public/private) - the involvement of the Czech Republic is essential: otherwise researchers without the possibility of participation.
- ➔ **European Partnerships are:**
  - ▶ **Co-programmed:** greater flexibility in implementation in terms of the composition of partners, objectives and activities, a wider community of partners, medium-term priorities; agreement, common agenda.
  - ▶ **Co-funded:** public-private partnerships in relation to national programs and policies, grant agreement and calls in work programs III.
  - ▶ **Institutionalised:** based on Article 185 or 187, or the EIT Knowledge and Innovation Community (KIC), central implementation structure, legislative process

# Horizon Europe and European Partnerships

- ➔ **Clean Energy Transition (CET)** - Co-funded partnership with the objective to coordinate and exploit the synergies of at least 25 national and regional R&D&I policies and programs and to develop joint programming and financial cycles by 2027
- ➔ **Strategic Research and Innovation Agenda - SRIA** (November 2020): **CETP Challenge 3**: Enabling climate neutrality with storage technologies, renewable fuels and **CCU/CCS**:
  - ▶ Develop and deploy energy storage, renewable based fuels, as well as **CCU/CCS (Carbon Capture and Use/Carbon Capture and Storage)** for a climate-neutral Europe.

# Thank you for you attention



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