



Ministerie van Economische Zaken
en Klimaat

SDE++

An introduction to the Dutch subsidy
scheme for renewable energy and
CO₂ reduction

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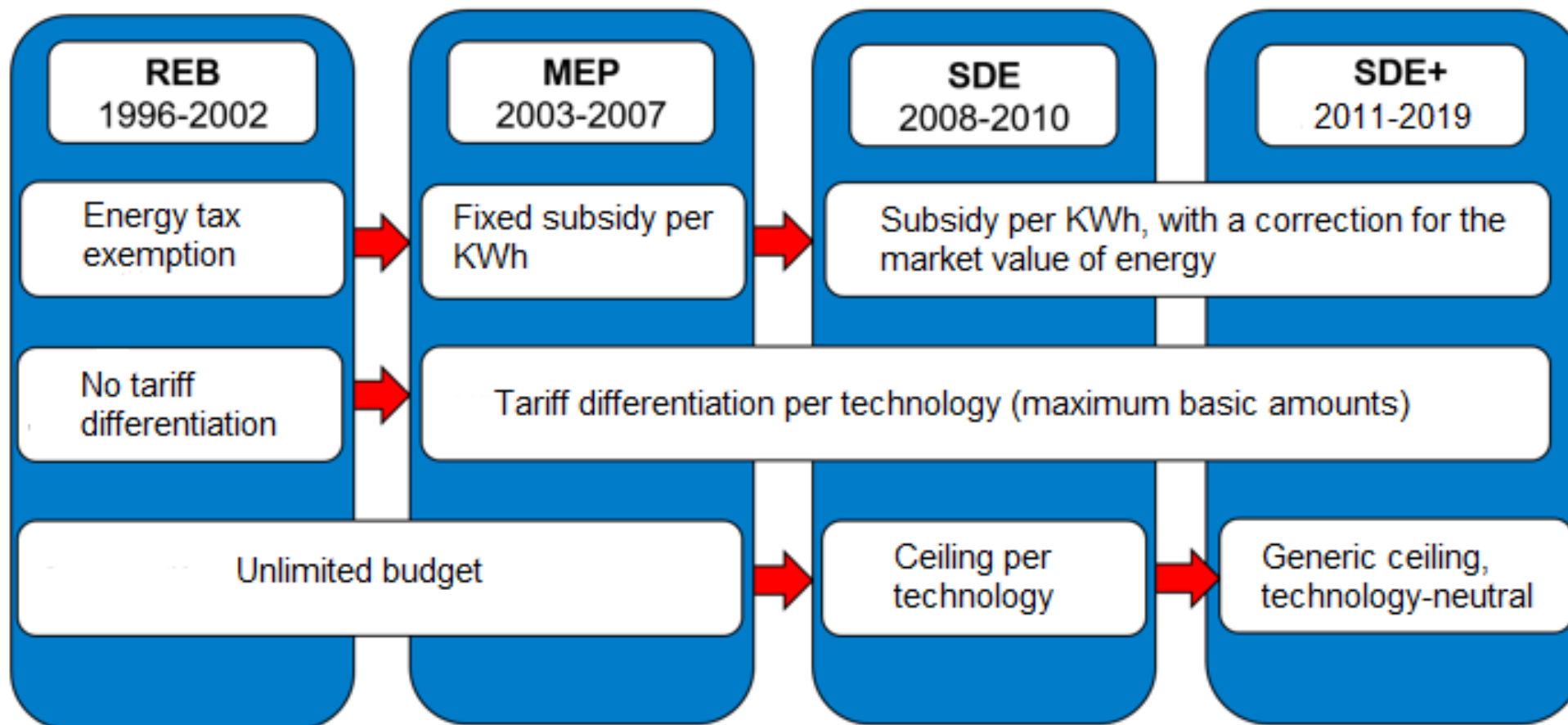


Agenda

- › Short history of the SDE++
- › What is the SDE++?
- › Carbon Capture and Storage (CCS) in the SDE++
- › Recent adjustments and future changes
- › Advice on financial parameters
- › Execution of the SDE++ (by Jan Bouke Agterhuis)
- › Q&A



A short history of the SDE(++)





From SDE+ to SDE++ (2020)

SDE+

- > Only renewable energy production technologies
- > Ranking based on €/KWh
- > Correction amount based on energy price



SDE++

- > Renewable energy production and CO₂ emission reduction technologies
- > Ranking based on € subsidy/ton CO₂
- > Correction amount based on e.g. energy price and/or CO₂ price, depending on technology



Basic principles of the SDE++

- Annual tender with budget of +/- € 8 bn
- Technology neutral
 - All approved technologies and sectors compete for budget
 - Separate tenders for offshore wind (currently without subsidy)
- Ranking based on cost-effectiveness (€ subsidy/ton CO₂)
- Focus on broader objective of CO₂ reduction including energy production
- Operational subsidy, offering long-term certainty
 - Subsidy paid out on an annual basis for 12-15 years
- Clear division of roles:
 - Between government (policy), RVO (implementation), market (consultation) and PBL (independent advice about financial parameters)



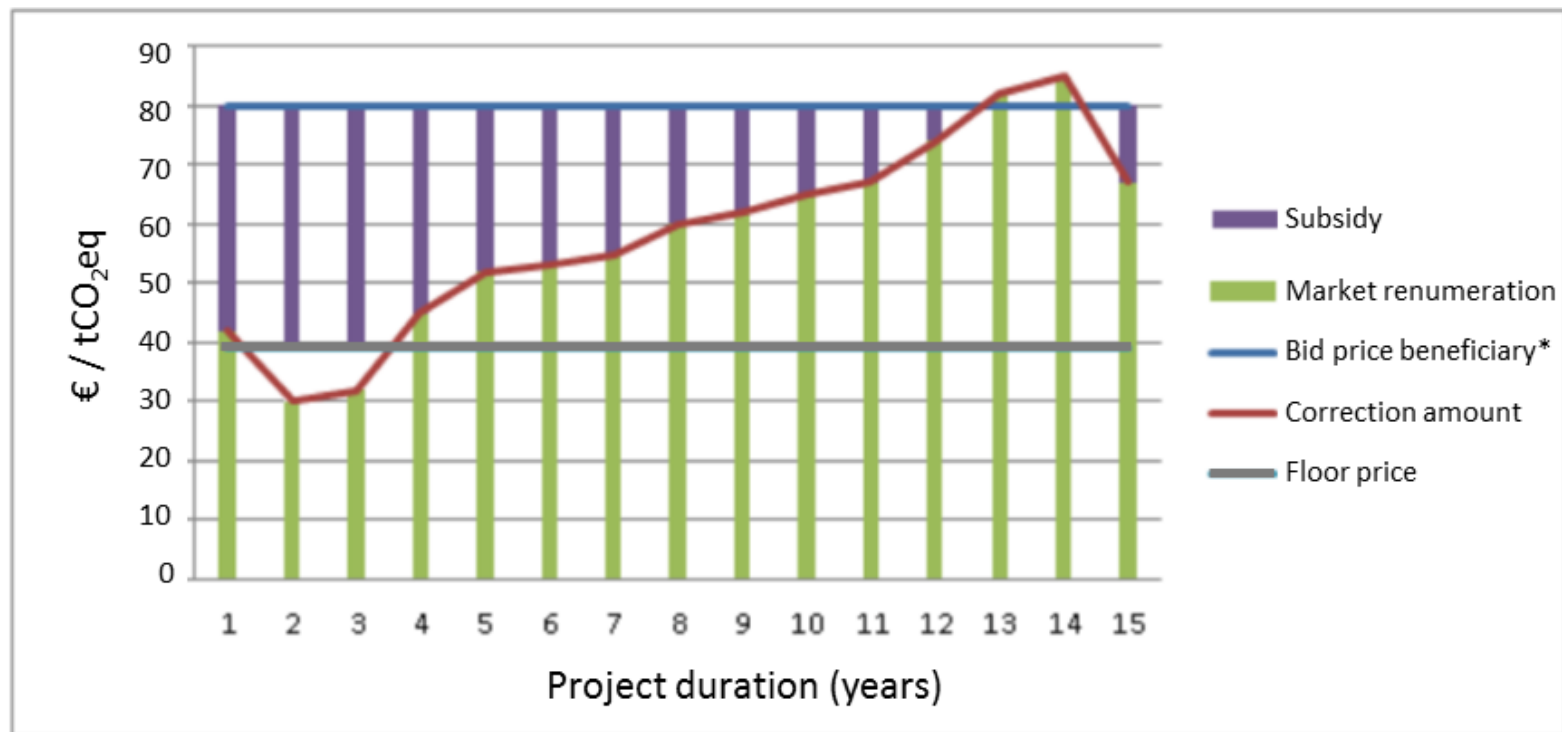
SDE++ main categories of technologies

- > 5 main categories:
 - Renewable electricity
 - Renewable gas
 - Renewable heat and cogeneration
 - Low CO₂ heat
 - Low CO₂ production (including CCS and CCU)
- } New options since 2020



SDE++ calculation method

- **“Sliding feed-in premium”**
- **Base amount:** cost price for the reduction of CO₂
 - Fixed for entire subsidy period
- **Correction amount:** product price
 - Based on real, annual energy and/or CO₂ prices
- **Floor price:** 2/3 of long-term energy and/or CO₂ price

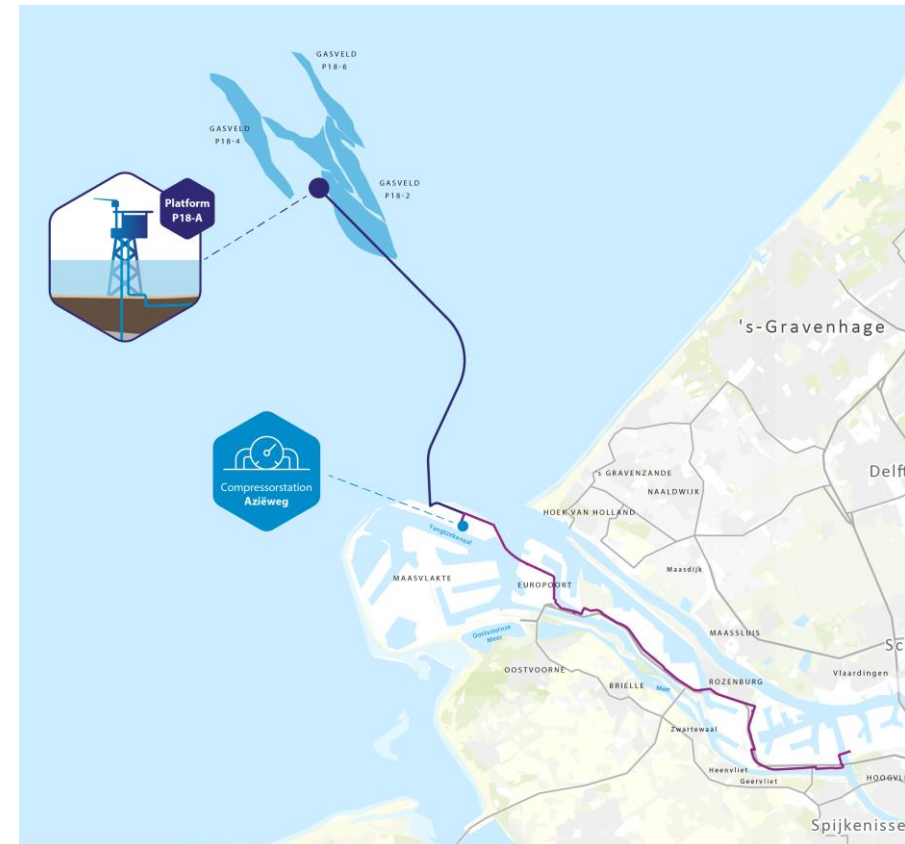


* The bid price is equal to or lower than the technology specific base amount.



CCS in the SDE++

- Subsidy directed at emitters, not at transport and storage infrastructure
 - Transport and storage fee is included within SDE++-subsidy
- Subsidy based on EU ETS-price
- Different amounts of subsidy depending on type of CCS:
 - Storage: gaseous or liquid
 - Method of capturing CO₂
 - ETS/non-ETS company
- SDE++ successful in helping establish first CCS-project of the Netherlands (2 mtpa)
 - New Dutch CCS-project, Aramis (7.5 mtpa), more complex





CCU in the SDE++

- Subsidy for supplying CO₂ to horticulture/greenhouses
- Subsidy for maximum of 4000 hours annually:
 - Supplied CO₂ meant to substitute CO₂ generated by fossil fuel fired cogeneration in summer → emission reduction
 - Typically combined with 4000 hours of CCS
- Subsidy based on avoided gas costs





Recent adjustments and future changes 1: fences

- SDE++: focus on cost-effectiveness
 - Downside: less room for more expensive technologies
- Since 2023: introduction of “fences” in SDE++
 - Flexible budget reservations for 3 technology groups
 - To stimulate technologies that are necessary in the transition & cost effective in the long term
 - Keep sufficient budget outside of fences to ensure cost effective CO₂ reduction
 - Remaining budget from fenced domains flows back into general budget

Electricity

CCS/CCU

Molecules

Low-temp heat

High-temp heat



Recent adjustment and future changes 2: renewable electricity

- › SDE++ offers subsidy for unprofitable technologies
 - Issue: Solar PV and onshore wind not (very) unprofitable, but price support still needed because of volatile and uncertain price levels
 - Risk of over-rewarding these technologies

- › Two-step solution:
 1. From 2024: claw-back of subsidies in times of high prices
 2. From 2027 (expected): 2-way Contracts for Difference



Advice on the financial parameters

- > PBL (environmental assessment agency)
- > Advice based on annual market consultation
- > Category-specific advice on:
 - Base amount
 - CAPEX, OPEX, WACC
 - Long-term prices
 - Emission factors (avoided emissions)
- Correction amount
 - Prices for electricity, heat, CO2

For annual
subsidy tenders

To determine
advances for
existing grants



SDE++ execution by RVO (Dutch Enterprise Agency)

- › Update communication resources
- › Assess 5,000 new project applications per opening round
- › About 28,000 projects in production, growing to aprox. 38,000 projects
- › Total granted about 77 billion EUR (2008-2022)
- › These processes take approx. 70 FTE and a lot of process automation.





Example: SDE++ 2023 round, applications

	Number	Claim	Capacity [MW]	CO ₂ - reduction	Average Subsidy- intensity
		[10 ⁶ EUR]	[MW]	[MtaCO ₂]	[EUR/tCO ₂]
Molecules	334	2,965	452	0.83	219
LT-Heat	191	2,355	535	0.75	169
HT-Heat	35	1,701	571	0.45	189
Renewable Electricity	1,387	1,690	3,799	0.39	-37
CCS/CCU	23	7,579		4.8	67
Total	1,970	16,290	5,357	7.21	95



Example: Applying & Granting 2023

- > Phased opening
- > Budget 8 bln. euro
- > Online portal: eLoket
- > About 5,000 applications per yearly subsidy round
- > Application have to include:
 - Building permits
 - Technical plan
 - Financial plan
- > Granting
 - FCFS
 - Within 13 weeks

Fase	Opens	Subsidy intensity
		EUR/ton CO ₂
1	September-05	90
2	September-11	180
3	September-18	240
4	September-25	300
5	Oktober 2 - Oktober 5	400 (300)*

- * 300 Max. for techniques outside domains
- 400 Max. for techniques inside domains



Realisation & Production

- › 2 - 6 years to build the installation (differs per technology)

- › Start of production: Renewable energy or CO₂ storage or ...
 - Start of subsidy payments
 - Every month
 - 12 or 15 year cycles
 - Subsidy = application amount – correction amount
 - Correction amount is set twice every year by PBL (preliminary, final)

- › Final settlement after 12 or 15 years





Production data

- › Determine production at start of production:
 - The SDE is an exploitation subsidy
 - Stay in control that payments are justified
 - Monthly data

- › Electronic Data retrieving from:
 - Issuing body for Certificates of Origin:
 - Verticer for renewable energy
 - Certified metering compagnies:
 - for instance for capturing CO₂

