MIDDEN

TNO innovation for life

Planbureau voor de Leefomgeving

MIDDEN CONFERENCE

NOVEMBER 30, 2021

TNO / PBL

MIDDEN CONFERENCE 2021
PROGRAMME

14:30	**Welcome & introduction to the MIDDEN network** Silvana Gamboa (TNO)
14:40	***Keynote by Gertjan Lankhorst*** *(Chairman of VEMW)*
14:55	***Keynote by Ernst Worrell*** *(Professor Utrecht University)*
15:10	**Session 1:** Modeling industry in the Climate and Energy Outlook 2021 Marit van Hout (PBL)
15:25	Coffee break
15:35	**Session 2:** Will decarbonisation affect the competitiveness of the Dutch chemical sector? Hettie Boonman (TNO)
15:50	**Session 3:** Is the Netherlands Fit for 55? Corjan Brink (PBL)
16:05	Short break
16:10	**Plenary discussion**
16:30	Closure

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MANUFACTURING INDUSTRY DECARBONISATION DATA EXCHANGE NETWORK

MIDDEN is a network that is aimed at building a knowledge base for decarbonisation options and is shared and recognised by all stakeholders

MIDDEN IS:

- A knowledge base for the energy transition of the Dutch industry to which science, market, and policy have access
- Tailored to Dutch industry
- Joint initiative by PBL and TNO since 2018
- Generated in collaboration with the companies
- The MIDDEN database contains information on current energy and material consumption of the manufacturing industry in the Netherlands and options for decarbonisation of its processes
- MIDDEN site: middenweb.nl

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PURPOSE

- Build a knowledge base for (future) decarbonisation options for the Dutch energy-intensive industry
- Provide a platform for industry knowledge exchange
- Stakeholders recognize and make use of MIDDEN data and reports

IMPACT

- MIDDEN supports industry, policymakers, analysts, and the energy sector in their common efforts to achieve deep decarbonisation.
- It provides a trustworthy overview of the Dutch industry configuration and a knowledge base for studying transition paths to 2050 with insights into economic perspective.
- Cooperation between parties is needed → The energy transition benefits from transparent, up-to-date and comprehensive public information.

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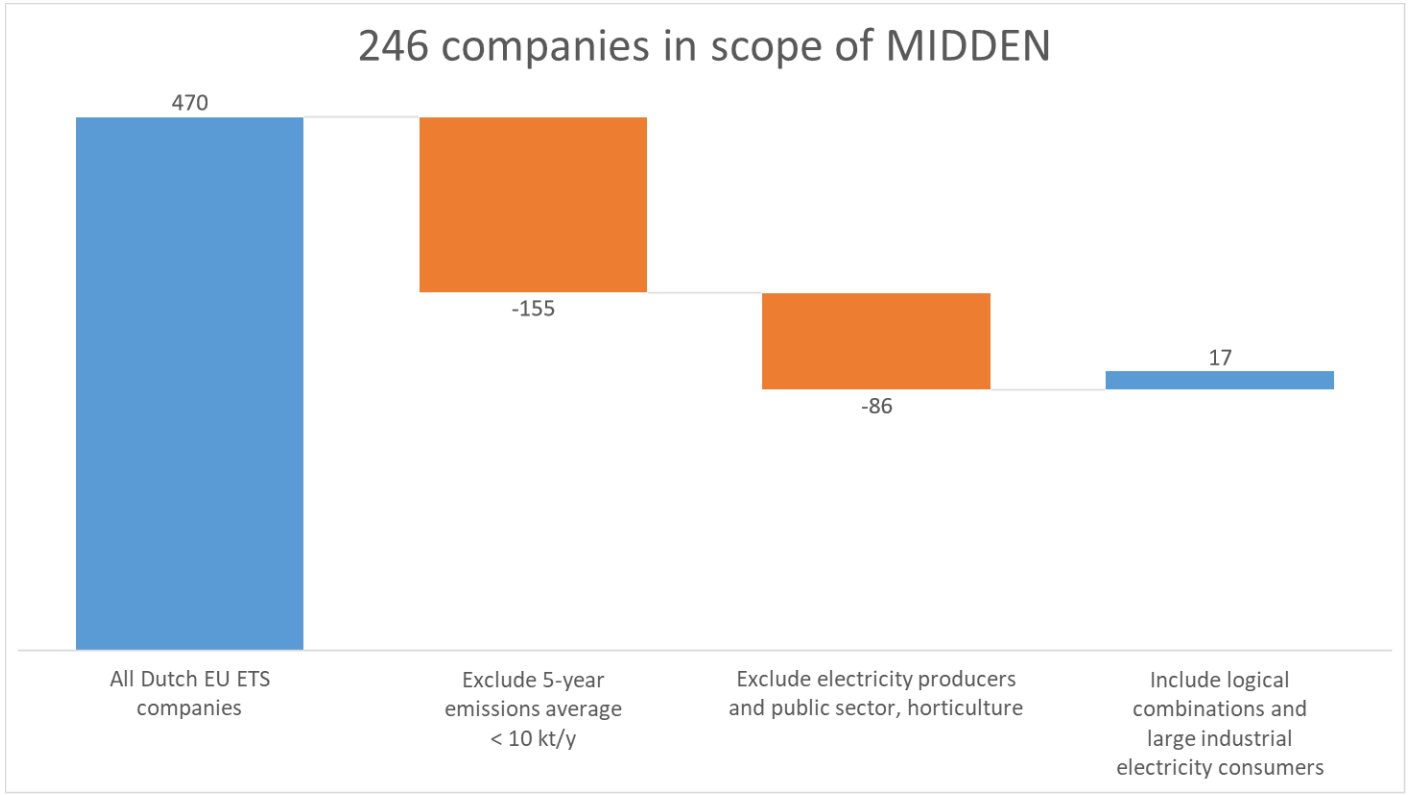
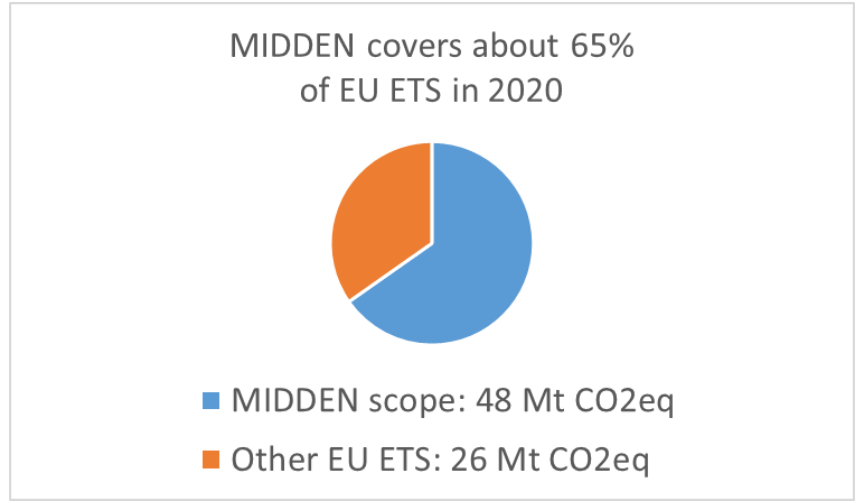
SCOPE

- Industry manufacturing companies under EU-ETS in the Netherlands





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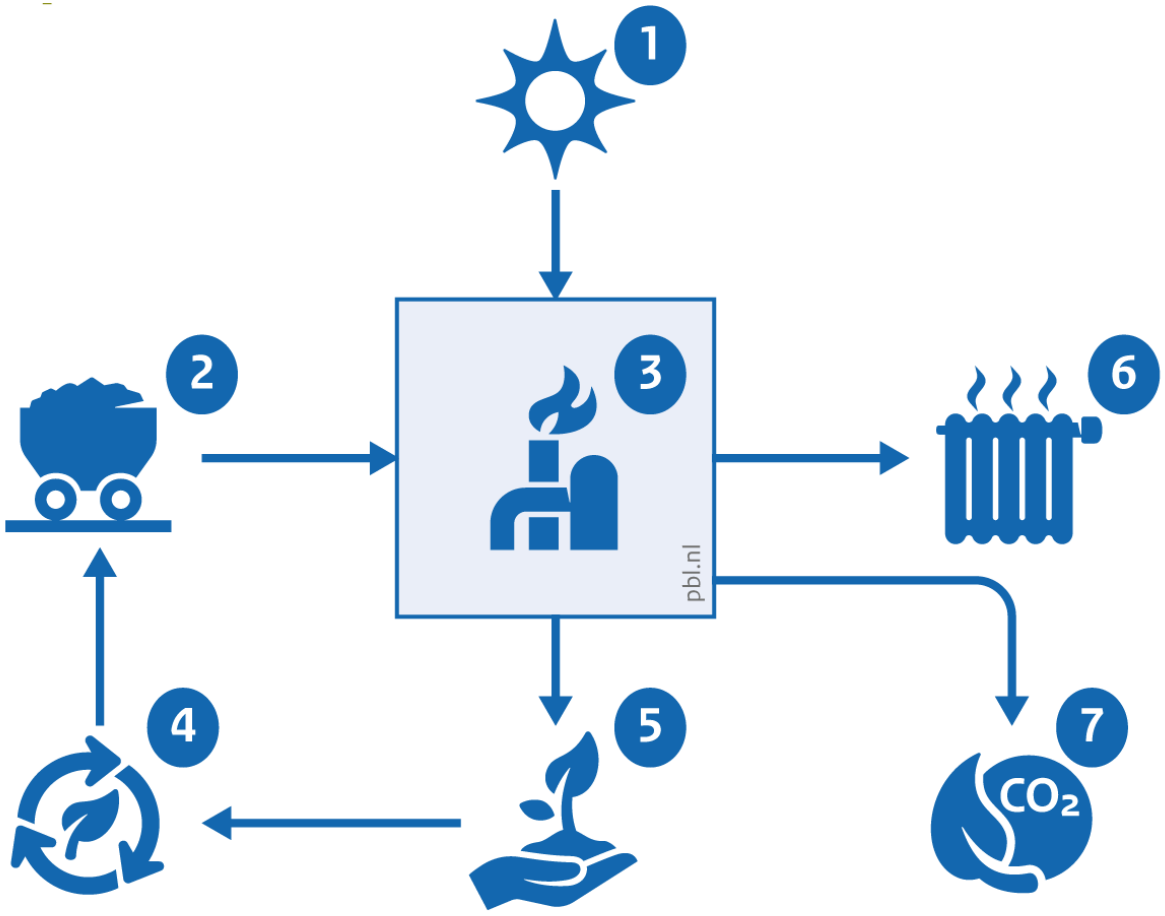
DECARBONISATION OPTIONS UNTIL ~2050



1. **Fuel substitution**
2. **Feedstock substitution**
3. **Process design**
   a. Energy efficiency
   b. Process substitution
4. **Recycling**
5. **Product design**
   a. Reduced use
   b. Substitution with product with smaller CO_2 footprint
6. **Use of residual energy**
7. **CO_2 capture and storage or re-use**

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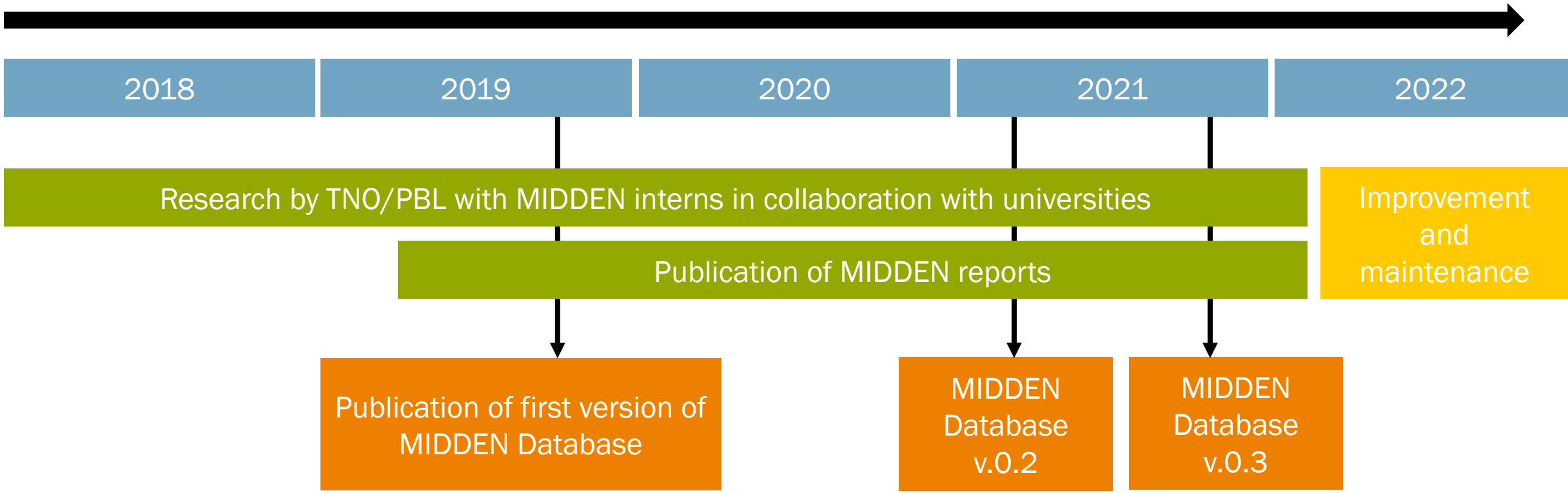
PROJECT TIMELINE



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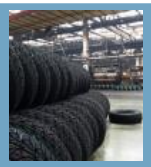
MIDDEN KNOWLEDGE BASE

REPORTS: 37 INDUSTRY SECTOR REPORTS PUBLISHED!

28 industry sector reports published since November 2019 and **5 additional reports** are expected soon!

2019

Zinc industry
Aluminium industry
Steel industry
Tyre industry
Sugar industry
Paper and board industry



Salt industry
Fertiliser industry
Container and tableware glass industry
Glass fibre
Glass wool
Stone wool

2020

Biofuels industry
Refinery sector
ExxonMobil Chemicals
Shell Pernis Chemicals
Shell Moerdijk Chemicals

Offshore natural gas
Carbon black industry
Ceramic industry
Potato products industry
Dairy processing
Starch industry

2021

Industrial gases production
Silicon carbide industry
Chlor-Alkali industry
Activated carbon industry
Maltings and breweries
Vegetable oil and fat industry

Dordrecht chemical cluster
Polyolefins industry
Polycarbonate industry
Bottle-grade PET industry
LyondellBasell
SABIC Geleen
Cement industry

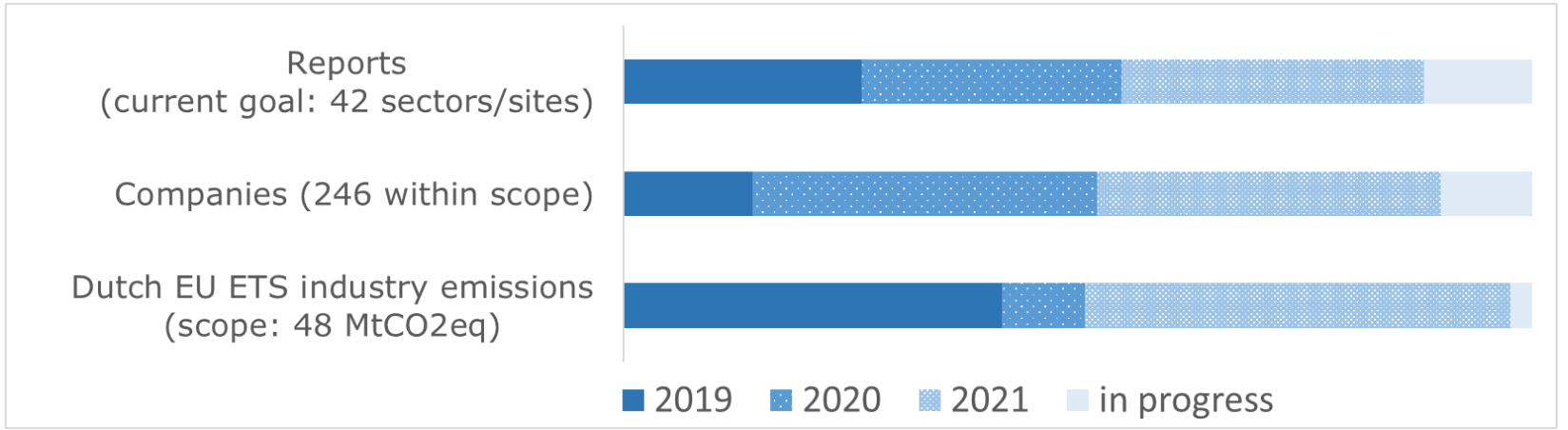
2022

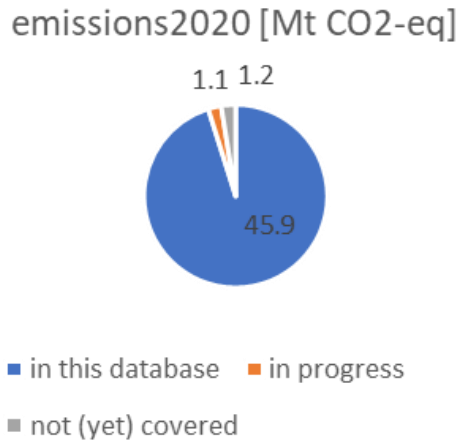
DOW Chemical
Asphalt industry
Waste incineration
Onshore natural gas
Botlek cluster

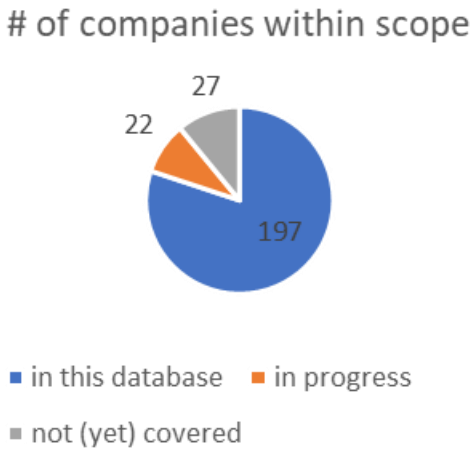
Available at middenweb.nl

MIDDEN KNOWLEDGE BASE

DATABASE: NEW VERSION AVAILABLE SINCE LAST WEEK!







Available at middenweb.nl

COLLABORATION BETWEEN TNO AND PBL

MIDDEN LONG-TERM PLANS

- TNO and PBL have expressed their intention to keep MIDDEN knowledge available and up-to-date until at least 2025!
- The MIDDEN network will remain active

- All MIDDEN reports and database can be found at middenweb.nl
- **Please share your feedback with us!**

MIDDEN SOUNDING BOARD AND PARTNERS

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VNPI

NOGEPA

Universiteit Utrecht

TU Delft

VNO NCW

FEDEC
energieadviseurs verenigd

vng

VNCI

Netbeheer Nederland

Radboud Universiteit Nijmegen

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nvde

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TKI ENERGIE & INDUSTRIE
Topsector Energie

VNM

Rijksdienst voor Ondernemend Nederland

KNB
Vereniging Koninklijke Nederlandse Bouwkeramiek

Ministerie van Economische Zaken

VNP

KONINKLIJKE vemw
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FOOD & BIOBASED RESEARCH
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