

Matjaž Česen

Presentation on undertaking emission projections in Slovenia

Joint EIONET/TFEIP 2021

Ljubljana, Slovenia
6.5.2021

Content

- About EEC / Institute
- System for projections in Slovenia
- Latest projections
- Results

Energy efficiency centre (EEC) in brief

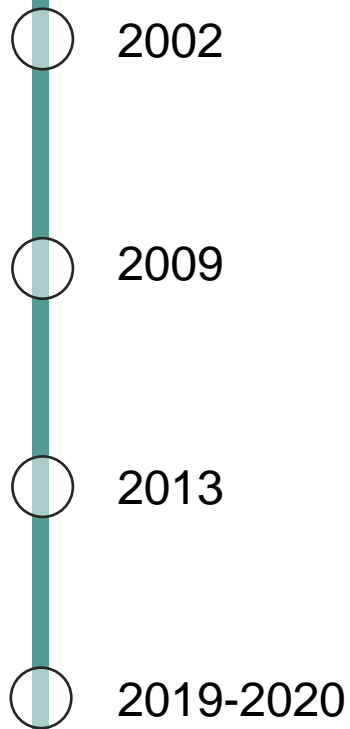
Established	○	1995
Organisation type	○	Independent centre within the Jožef Stefan Institute
Staff	○	20 (JSI - 1053)
Focus	○	Industry and application oriented projects with strong background in energy related research Expert support to the development of national strategies and action plans in the field of energy, climate and air pollution Expert training and education International cooperation

System in place

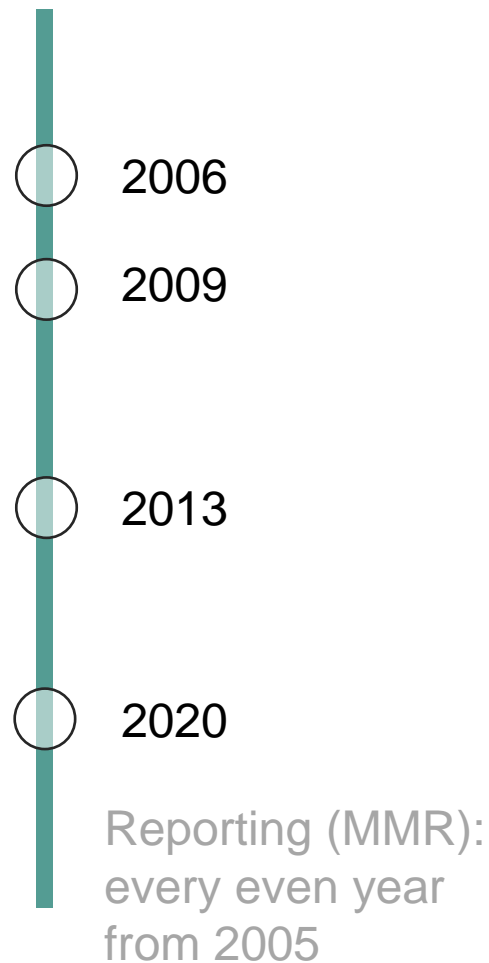
- Preparation of AP projections: project based (contract with the Ministry of environment and spatial planning)
(separate project/contract for energy and GHG emission projections – tied to preparation of strategic documents)
- Cooperation of different institutions:
 - JSI – Energy efficiency centre (energy (incl. transport), waste, solvent use (with subcontractors))
 - Agricultural institute (agriculture)
 - Strong cooperation with EARS (inventory)

Context of projections

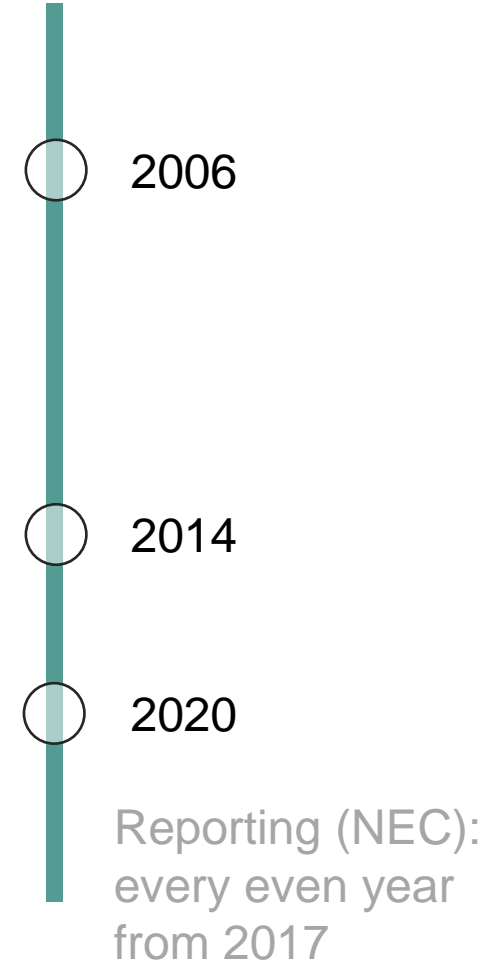
Energy projections



GHG emission projections

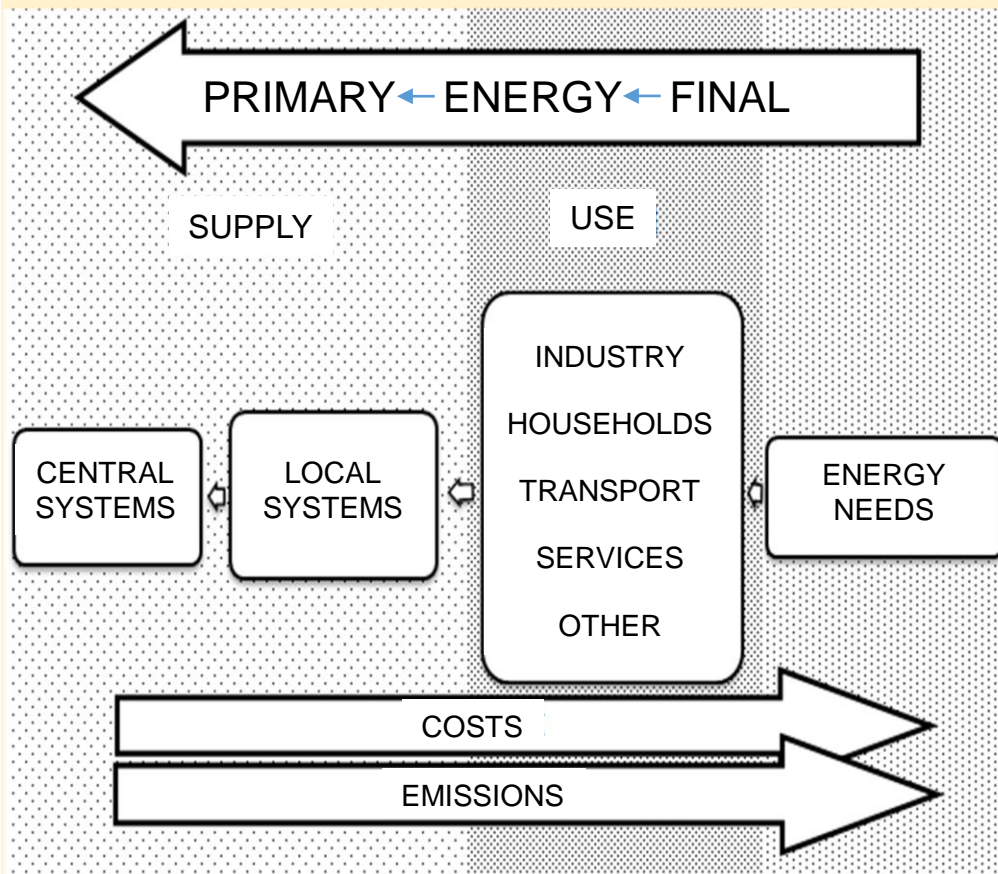


AP emission projections



Models used

Energy model (REES-SLO)



Mainly based on inventory models

Agriculture model

Solvent model

Industrial processes model

Waste model

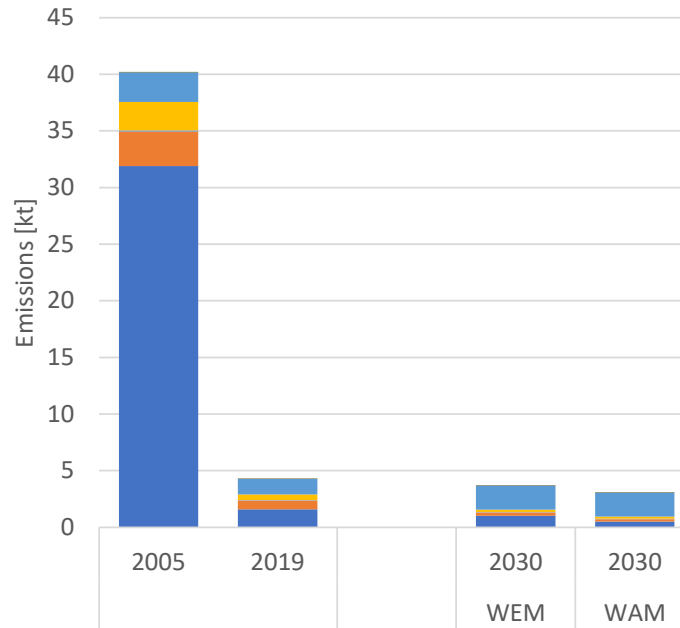
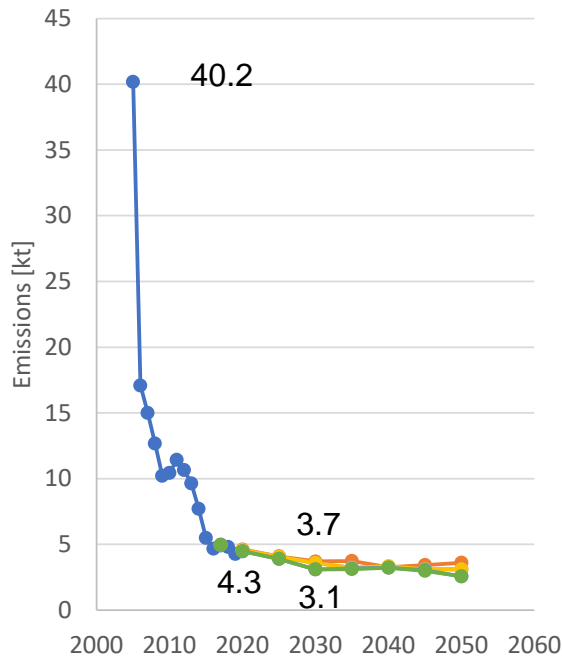
- Linear **simulation** model
- **Technologically oriented** (bottom up) model
- Implemented in **MESAP environment** – free structure
- Input parameters: industrial activity, buildings area, demography, transport activity, ...
- Emission factors per technology

Latest projections

- Prepared under project **LIFE Climate Path 2050** (2017-2021) – energy, GHG and AP projection for majority of sources and **contract with the Ministry (MESP)** – AP projections for solvents, industrial processes
- Base year **2017**; covering period **2020-2050**
- **5 scenarios:**
 - With existing measures (WEM)
 - With additional measures – **moderate** (two variants – after 2030)
 - With additional measures – **ambitious** (two variants – after 2030) (WAM – variant with synthetic gas in transformation)
- SO₂, NO_x, NMVOC, NH₃, PM (TSP, PM 10, PM 2.5), BC

SO2

SO2



- Energy supply (1.A.1 & 1.B)
- Industry (1.A.2)
- Transport (1.A.3)
- Other sectors (1.A.4 & 1.A.5)
- Ind. Proc. (2.A, 2.B, 2.C, 2.H)
- Solvent use (2.D* & 2.G)
- Agriculture (3.)
- Waste (5.)

2020/2005

-89 % (-63 %)

2030/2005

-91 % , -92.3 % (-92 %)

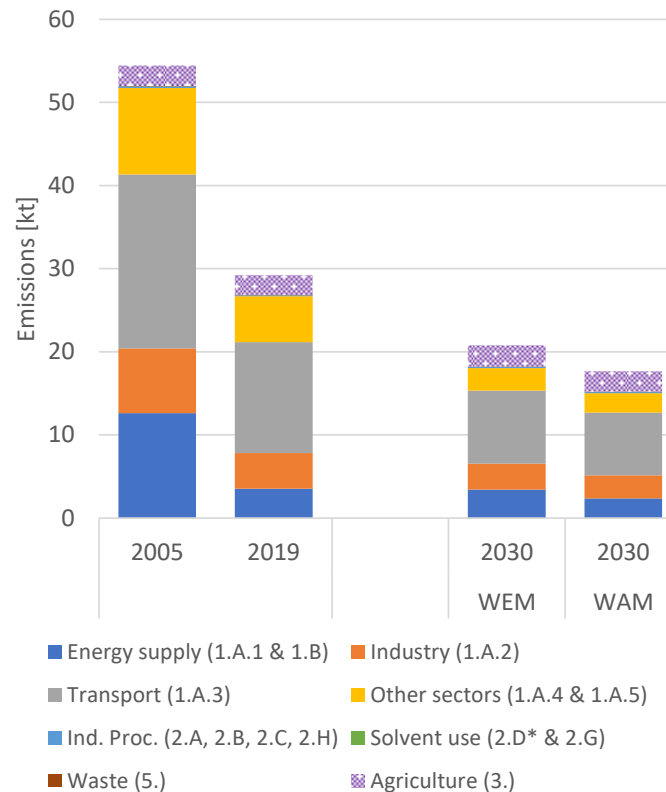
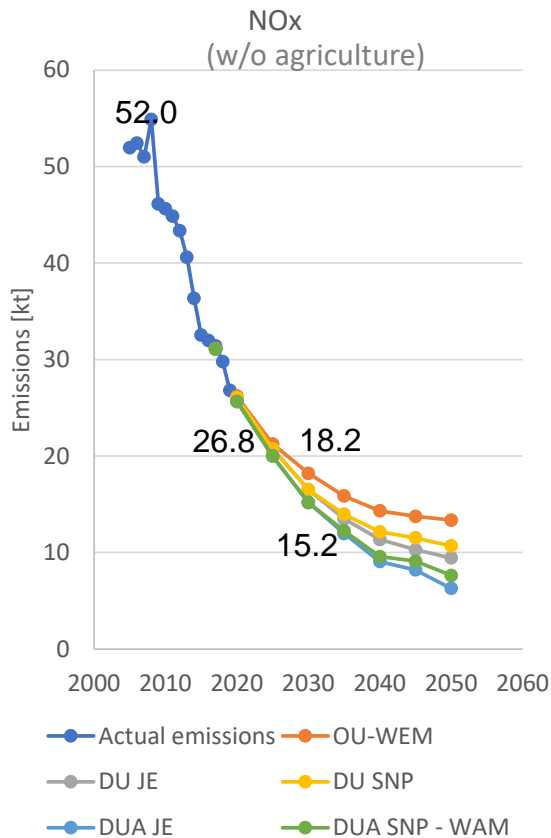
Sectors 2030:

1. Energy supply (16 %)
2. Ind. proc. (69 %)
3. Industry (7 %)
4. Other sectors (6%)
5. Transport (1%)

Decrease: Reduction of use of fossil fuels

Increase: Production

NOx



2020/2005

-50 %, - 51 % (-39 %)

2030/2005

-65 % , -71 % (-65 %)

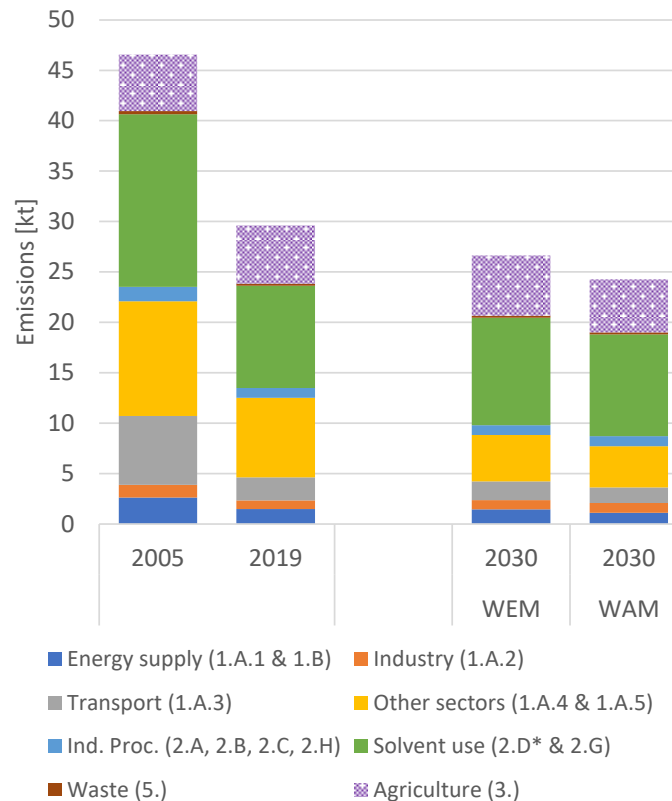
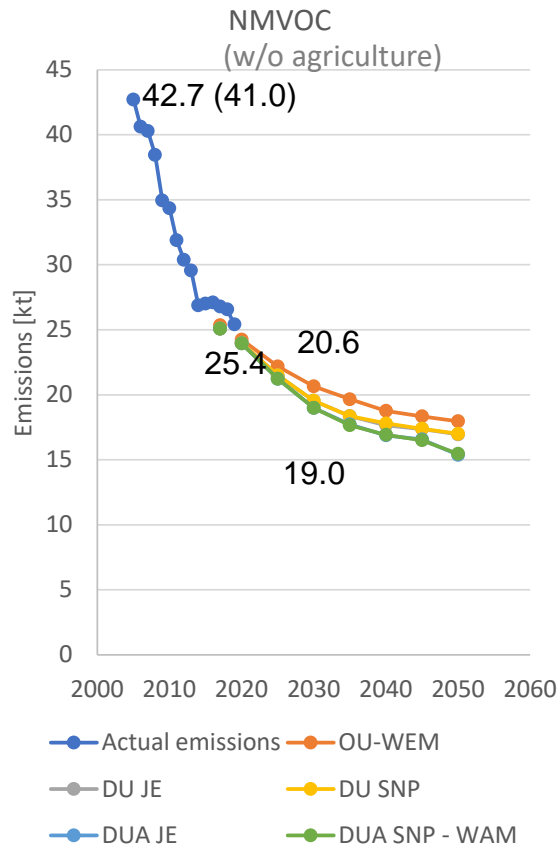
Sectors 2030:

1. Transport (43 %)
2. Industry (16 %)
3. Energy supply (13 %)
4. Other sectors (13 %)
5. Ind. proc. (1 %)
6. Agriculture (14 %)

Decrease: Reduction of use of fossil fuels, (EURO) standards

Agriculture: no change

NMVOC



2020/2005

-43 %, - 44 % (-23 %)

2030/2005

-52 % , -53.6 % (-53 %)

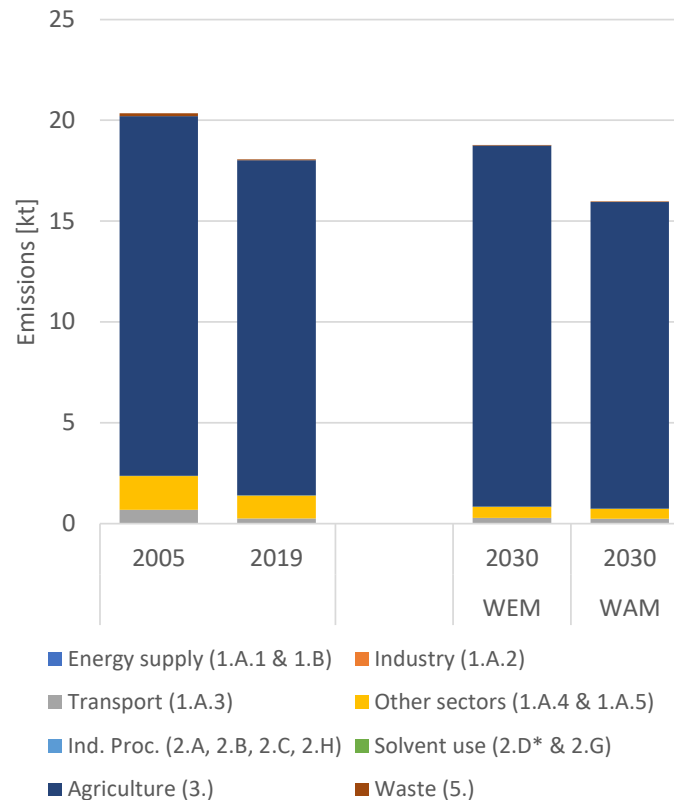
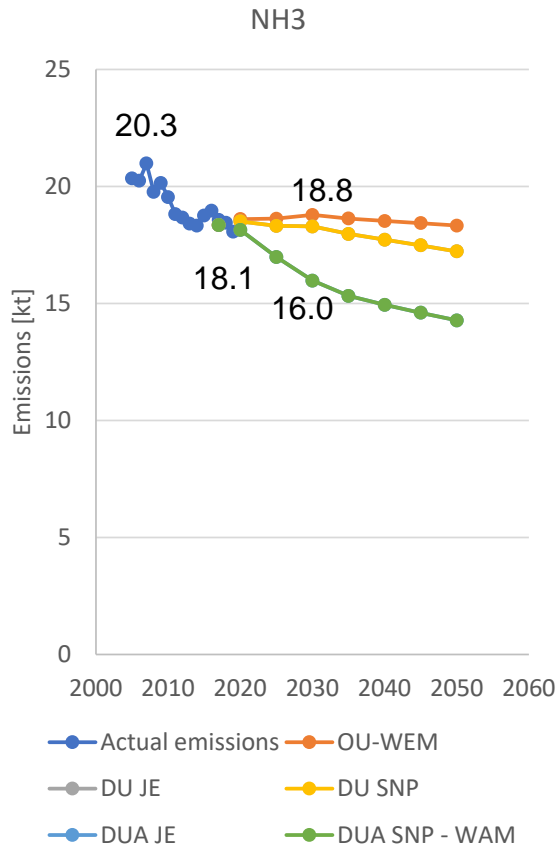
Sectors 2030:

1. Solvent use (42 %)
2. Other sectors (17 %)
3. Transport (6 %)
4. Energy supply (5 %)
5. Industry (4 %)
6. Ind. proc. (4 %)
7. Waste (1 %)
8. Agriculture (22 %)

Decrease: Reduction of use of fossil fuels and wood, EURO standards

Industry, Solvent use, Agriculture

NH3

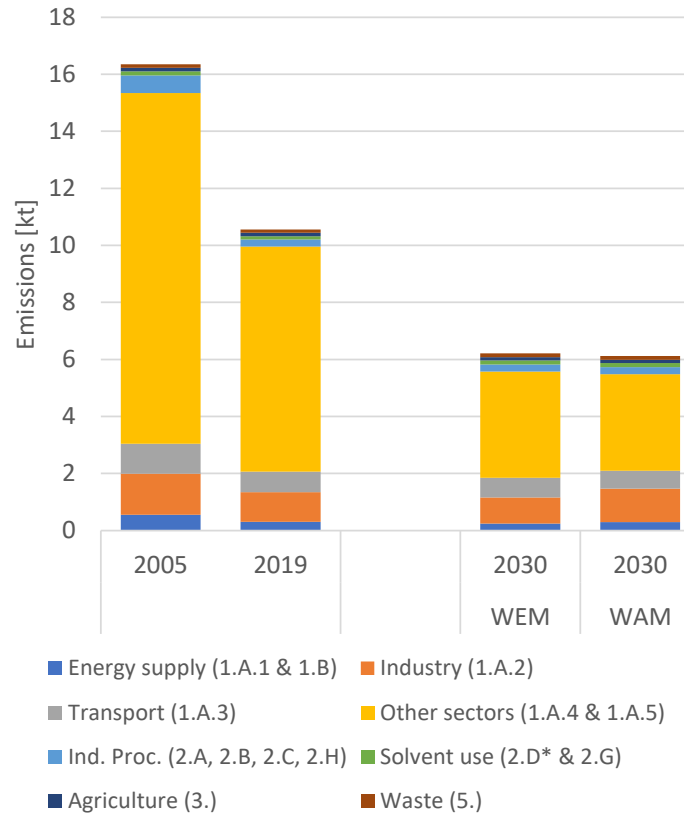
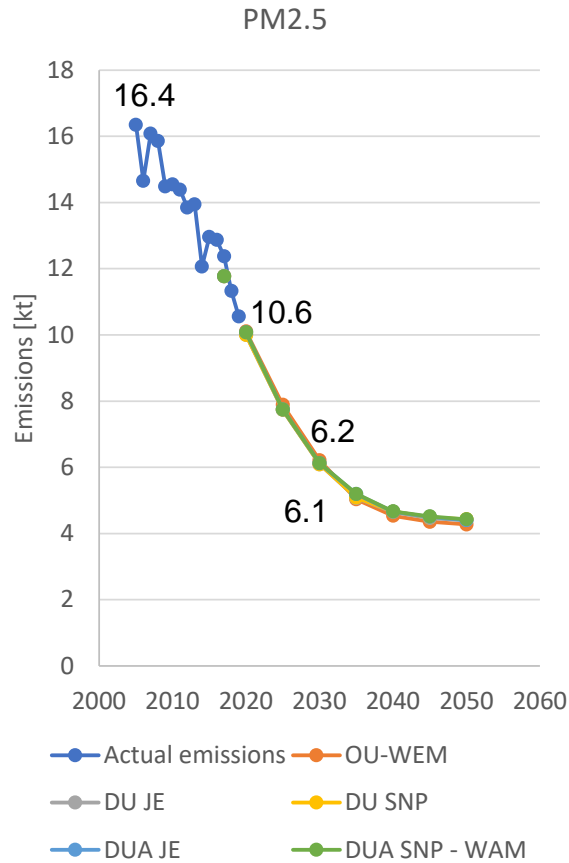


2020/2005
-9 %, -11 % (-1 %)
2030/2005
-8 % , -21 % (-15 %)

Sectors 2030:
1. Agriculture (95 %)
2. Other sectors (3 %)
3. Transport (1 %)

Decrease: Better management and application of animal manure

PM 2.5



2020/2005

-38 % (-25%)

2030/2005

-62 % , -63 % (-60%)

Sectors 2030:

1. Other sectors (55 %)
2. Industry (19 %)
3. Transport (10 %)
4. Energy supply (5 %)
5. Ind. proc. (4 %)
6. Other (6 %)

Decrease: Reduced use of wood, replacement of boilers, EURO standards

Increase: industry

Reporting on projections

- Reporting burden increased with 2016 NECD (more detailed description on projections, mandatory biennial reporting)
- Review of projections 2019 (major improvements in latest projections) – hard to follow yearly improvements in inventory

Table 3-2 Quality of the Projections Submission

Pollutant	Year	Transparency of reporting	Comparability of reporting	Completeness of reporting	Consistency of projections	Accuracy of Projections
SO ₂	2020	Major improv.	Good	Major improv.	Major improv.	Major improv.
NO _x	2020	Major improv.	Good	Minor improv.	Minor improv.	Minor improv.
NM VOC	2020	Major improv.	Good	Minor improv.	Minor improv.	Minor improv.
NH ₃	2020	Major improv.	Good	Minor improv.	Minor improv.	Minor improv.
PM _{2.5}	2020	Major improv.	Good	Minor improv.	Minor improv.	Minor improv.
SO ₂	2030	Major improv.	Good	Major improv.	Major improv.	Major improv.
NO _x	2030	Major improv.	Good	Minor improv.	Minor improv.	Minor improv.
NM VOC	2030	Major improv.	Good	Minor improv.	Minor improv.	Minor improv.
NH ₃	2030	Major improv.	Good	Minor improv.	Minor improv.	Minor improv.
PM _{2.5}	2030	Major improv.	Good	Minor improv.	Minor improv.	Minor improv.

Conclusions

- Preparation of projections **tied to projects** (no longterm framework available – lack of development of the model)
- Projections **consistent** with energy and GHG emissions projections
- Very **detailed technological model** enabling very detailed modelling and good evaluation of effect of different measures
- Projections of AP emissions much **more demanding** that GHG emissions – **complexity** of projections **increasing** – great value of studies from other countries
- Currently **ongoing work to couple** emission projections and air quality modelling – Slovenia has problems with PM 10
- Projections are important for policy development – reporting is a burden even if data are available

Thank you!

matjaz.cesen@ijs.si

Jamova 39
1000 Ljubljana, Slovenija
Tel: +386 1 5885 210
www.ijs.si

