

**Interreg
Europe**



Co-funded by
the European Union

EXPRESS

North Karelia sustainable transport & hydrogen projects

EXPRESS Thematic workshop, Rzeszow 24.10.2023

Timo Tahvanainen, Lead partner Project manager

timo.tahvanainen@pohjois-karjala.fi

Climate goals challenging for traffic sector – decisions made at National level

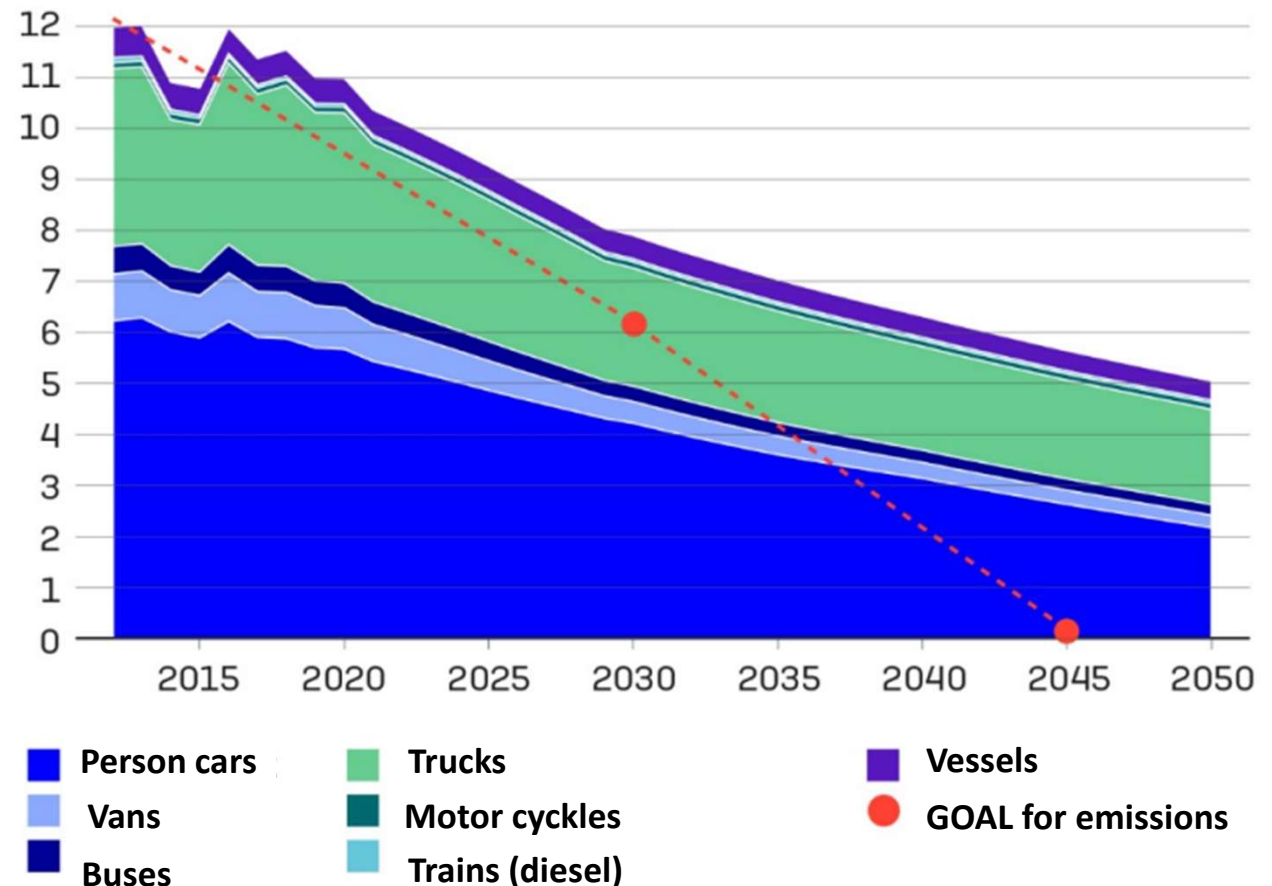
TOOLBOX:

1. Blending traffic fuels with bio-component

Year	Blending obligation, %		
	Old	1.1.2023-	New Gov.
2021	18,0		
2022	12,0		
2023	21,0	13,5	
2024	22,5	28,0	13,5
2025	24,0	29,0	16,5
2026	25,5	29,0	19,5
2027	27,0	30,0	22,5
2028	28,5	31,0	31,0
2029	30,0	32,0	32,0
2030	30,0	34,0	34,0

2. Electric cars
3. Public transport, walking & cyckling
4. Biogas
5. Remote work
6. Approaching new technologies

Finnish traffic sector CO2 emissions (Mt) – basic scenario



SOURCE: Roadmap to fossil-free transport. Finnish Ministry of Transport and Communications. 2021.
<http://urn.fi/URN:ISBN:978-952-243-588-0>

Long distances – traffic's share of energy consumption is high in North Karelia

Energy consumption - North-Karelia (GWh)

Source	2008	2010	2012	2014	2016	2018	2020	%
Wood	4 915	5 948	5 780	6 140	5 723	5 955	5 722	51,7 %
Heat pumps	80	127	190	211	232	260	351	3,2 %
Other renewables	60	132	18	13	19	21	33	0,3 %
Renewable electricity ¹	1 210	1 211	1 533	1 352	1 471	1 471	1 457	13,2 %
Non-renewable electricity ²	645	1 422	1 134	1 536	1 512	1 345	992	9,0 %
Traffic fuels³	1 366	1 336	1 328	1 281	1 328	1 353	1 329	12,0 %
Energy peat	691	558	479	509	612	515	344	3,1 %
Heating oil	682	738	587	566	505	428	449	4,1 %
Oil, machinery	397	365	338	407	418	441	396	3,6 %
Other non-renewables	0	6	2	0	0	0	0	0,0 %
TOTAL	10 046	11 843	11 389	12 015	11 820	11 789	11 073	100,0 %
Share of renewables	62,6 %	63,3 %	67,0 %	65,8 %	63,9 %	67,0 %	71,0 %	

Energy self-sufficiency:

66,0 %

1) Includes regional hydro and imported renewable electricity

2) Includes imported non-renewable electricity

3) Includes also blended bio component

Joensuu
Vuoden pyöräilykunta 2014

©THM



City of Joensuu - Investments in cycling infrastructure:
23,4 M€ in 2014 - 2020

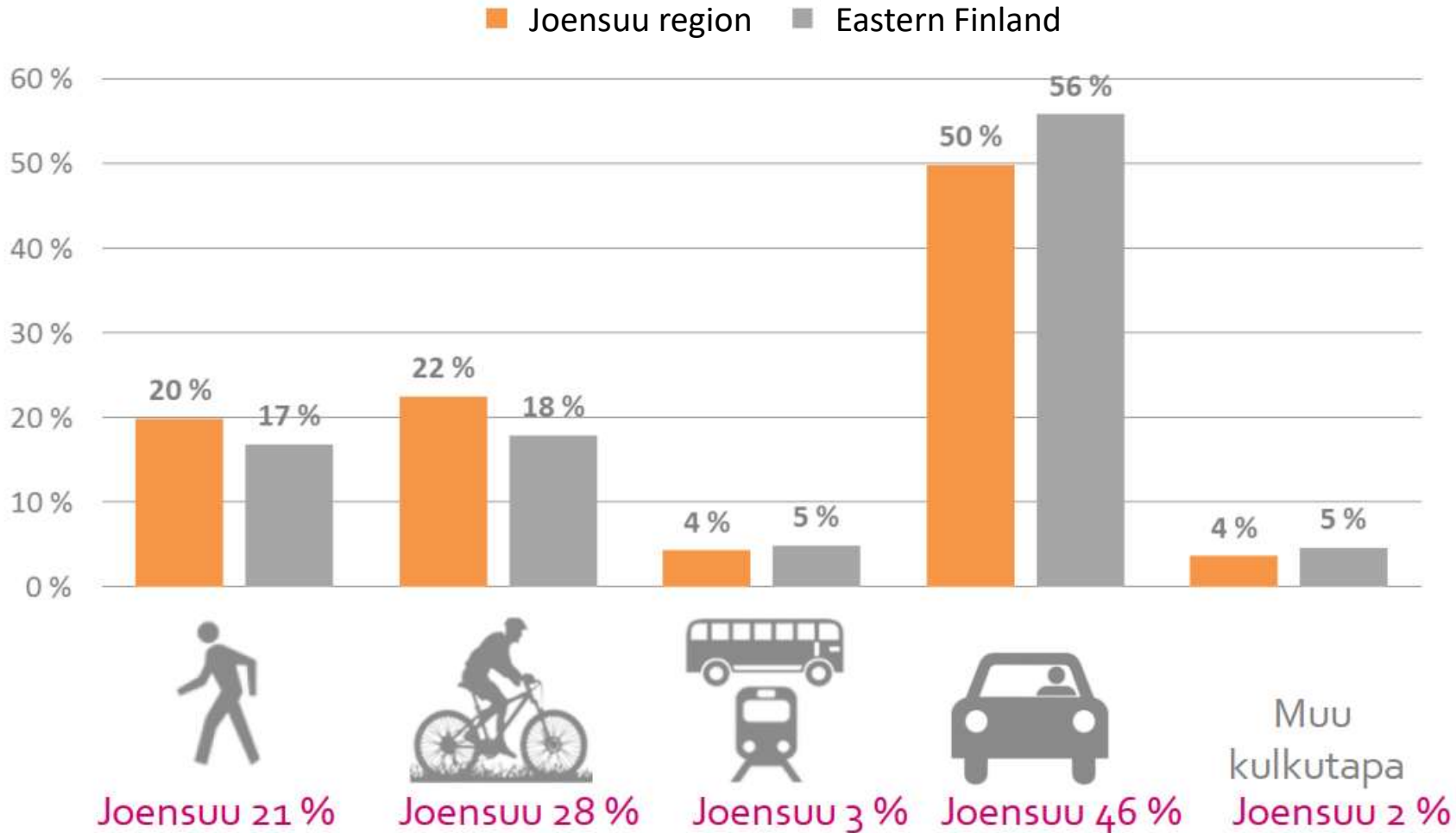
J • ENSUU



J • ENSUU

DISTRIBUTION OF TRIPS BASED ON THE MAIN MEANS OF TRAVELING - JOENSUU REGION VS. EASTERN FINLAND

SOURCE: Survey on state of moving habits in Eastern Finland



Benefits

- More comfortable city environment
- Increasing traffic safety and general feeling of safety
- Increasing value of residential areas
- Positive health effects (exercise – air quality)
- Positive climate effect
- Positive image: Joensuu is known as one of the two best cycling cities in Finland



Tendering of bus traffic in Joensuu City area for 2021-2028

- **Content:** 17 busses, 3 mini busses, 1 mid-distance bus
- **Criteria:** costs 86p / quality 14p
 - EuroV1 0,01p and HVO 0,02p / car / year
 - Biogas: 0,08p / car / year
 - Electricity: 0,10 p / car / year

→ 13 low-floor electric busses on duty

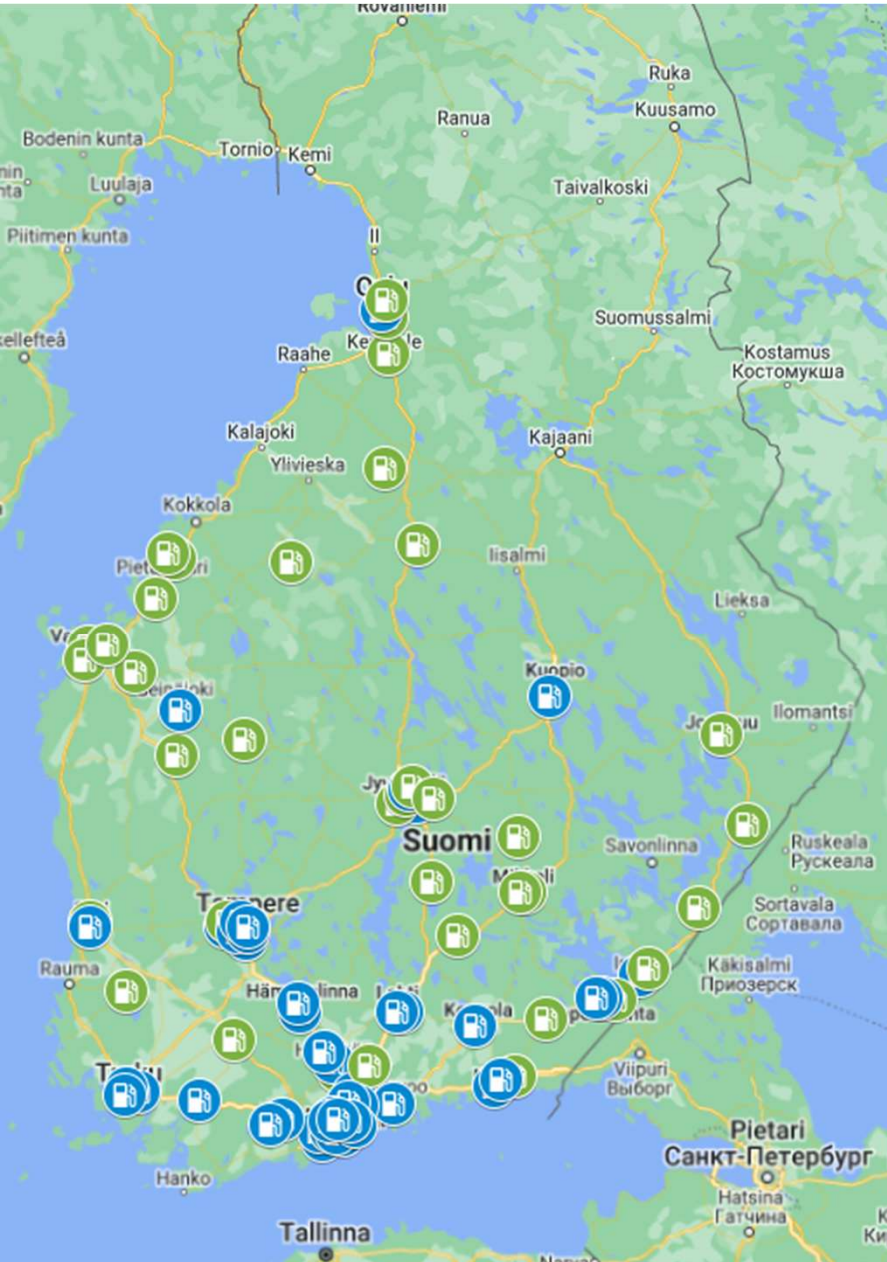
NEXT: Tendering for two mid-distance bus routes under preparation

- 11 + 5 busses
- 8 + 8 busses
- Biogas & electricity gaining equal points



Biogas for traffic launched in 2023

- 83 CBG/CNG and 16 LBG/LNG stations in Finland
- In North Karelia the two first CBG stations by Bio-10 & Wegas
 - Started in 2023 in Joensuu and in Kitee
- 3 new biogas production projects
 - Puljonki Oy / Nestle in Juuka (07/2023)
 - Pielisen Bio Oy in Lieksa (2024? - incl. filling station)
 - Valio Oy & ST1 Oy in Nurmes (2026)



Renewable electricity investments are critical for hydrogen production investments in North Karelia!

1. Solving of military radar problem

- Currently blocking wind energy investments
- New technologies + joint EU border strategy
- **Lobbying + cooperation with other Finnish border regions**

2. Strengthening of National grid connections

- Affecting on Fingrid investment plan for 2024-2033 (on-going)
- Hen & egg situation: Fingrid waiting for response to the radar problem
- **Regional land use plan process** (Energy and landscape thematic plan)
- **Lobbying + cooperation with other Finnish border regions**

→ The critical measures for achieving EXPRESS goals for the 80% share of renewable and domestic energy!

P2X Oy hydrogen project in Biotie Circular Park Joensuu (in synergy with the Savon Voima Oy CHP plant)



- Waste heat (80-110) GWh utilized in Joensuu district heat network (substitutes energy wood)
- Biogenic CO₂ (ca. 25,000 t) captured from energy wood combustion
- Green electricity input ca. 250 GWh
- Water consumption ca. 45,000 m³

- Plant capacity: 30–35 MW of green hydrogen
- End products = green chemicals / fuels:
 - E-Methane 10,000 t/a OR
 - E-Methanol 24,000 t/a
 - Oxygen 45,000 t/a
- Plant starts in 2026
 - P2X Oy is currently building 1st pilot plant (20 MW) in Harjavalta
 - Commission has notified projects for IPCEI funding in 2022

Competing green hydrogen refining technologies and processes – new concepts approaching



Renewable electricity
+ water

Residual wood biomass

Electrolysis

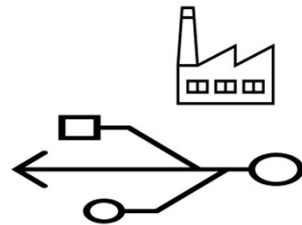
Biomass gasification

Methanol synthesis

Heat

Renewable methanol

2. Project in North Karelia:



Thank you!

www.interregeurope.eu/EXPRESS

