

**BUSINESS
FINLAND**

**INVEST IN
FINLAND**

Finland The most competitive hydrogen economy country in Europe

**Lappeenranta
September 11, 2024**

**Markku Kivistö
Head of Industry, Cleantech
Invest In
Business Finland**

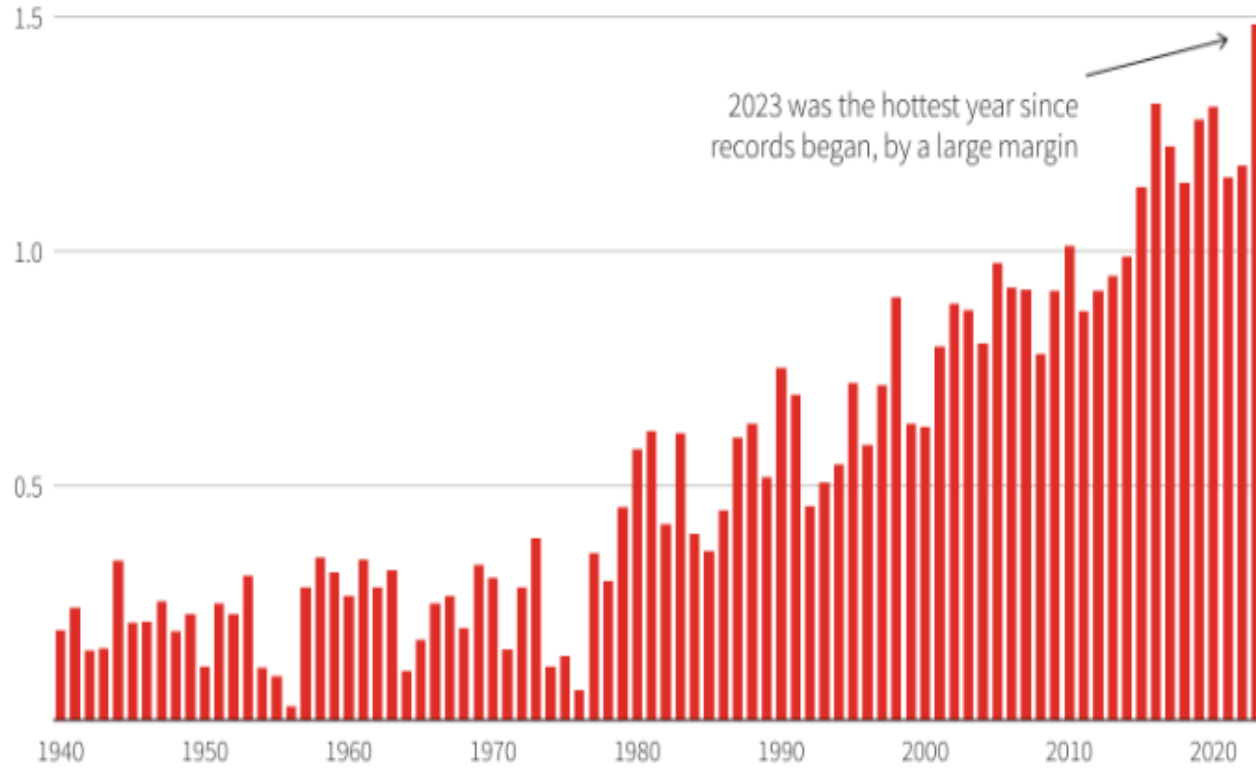
THANK YOU

FINLAND IS OPEN FOR BUSINESS

HEAT IS ON

2023 was the world's hottest year on record

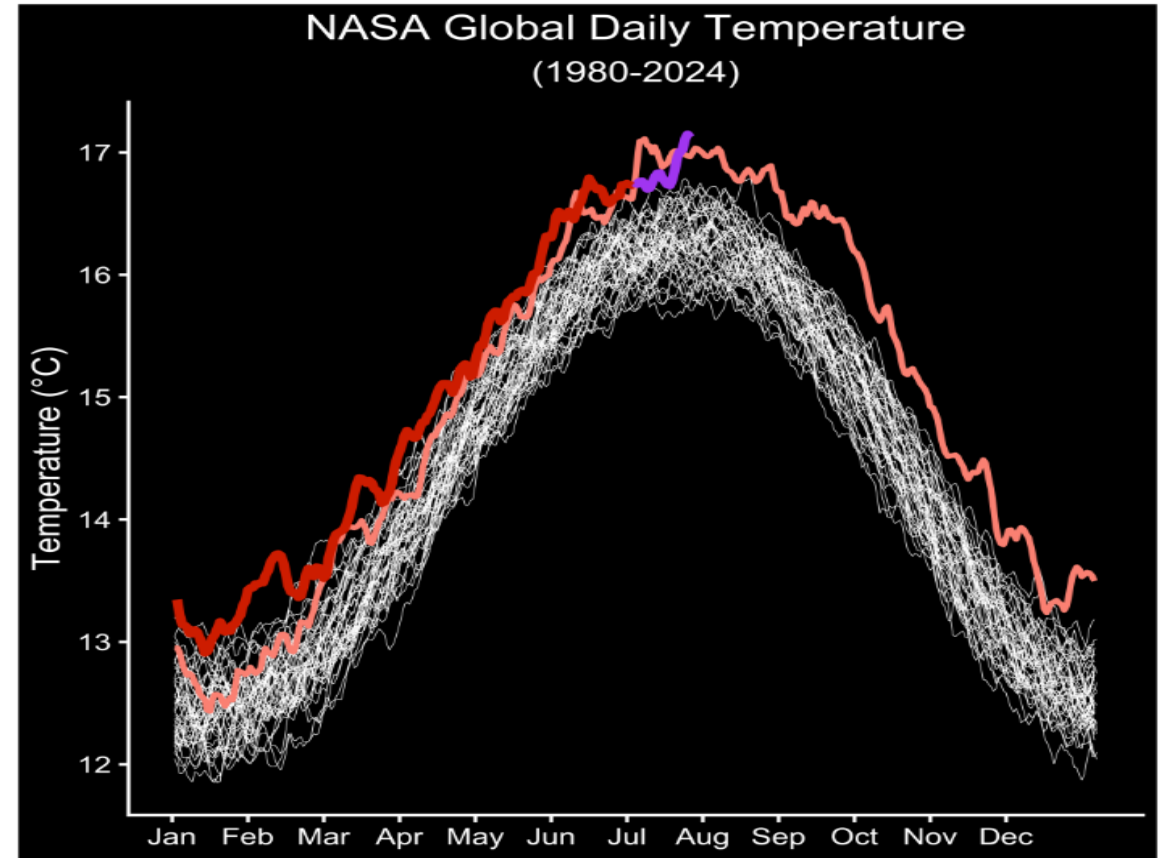
Global surface temperature increase versus the average during the 1850-1900 pre-industrial period (°C)



Source: Copernicus Climate Change Service/ECMWF

Reuters Graphics

World Record 22.7.2024



Daily global average temperature values from MERRA-2 for the years 1980-2022 are shown in white, values for the year 2023 are shown in pink, and values from 2024 through June are shown in red. Daily global temperature values from July 1-July 23, 2024, from GEOS-FP are shown in purple.

Source: [Nasa](#)

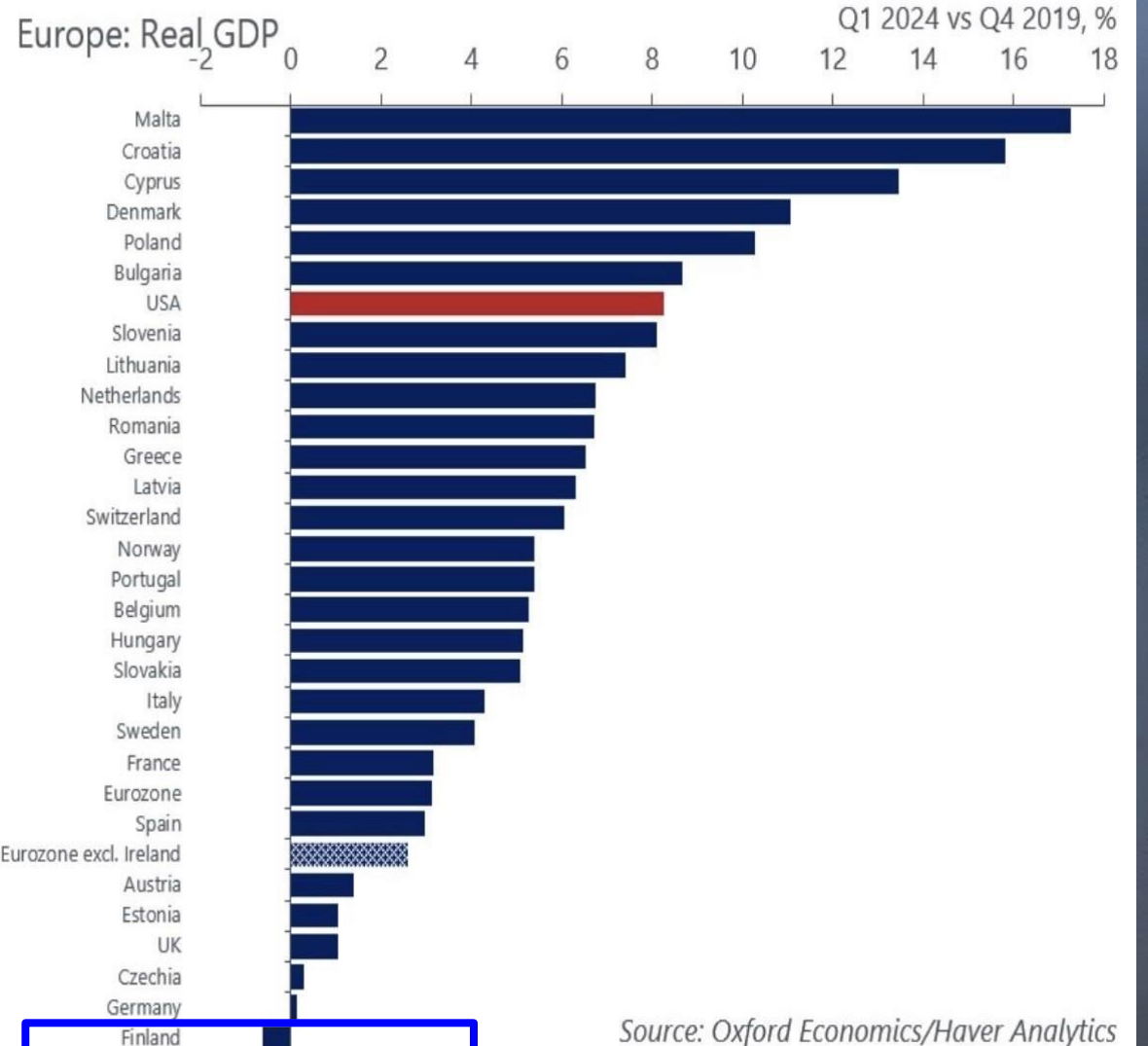
Index of the 30 most competitive countries in 2024

FINLAND #15



REAL GDP CHANGE – Q4/2019 – Q1/2024

FINLAND























Source: Oxford Economics/Haver Analytics

SUSTAINABILITY – FINLAND #1

- 3RD YEAR IN A ROW


[Chapters](#)
[Rankings](#)
[Interactive Map](#)
[Country Profiles](#)
[Data Explorer](#)
[Downloads & Materials](#)

Rank	Country	Score	Performance by SDG
1	 Finland	86.76	
2	 Sweden	85.98	
3	 Denmark	85.68	
4	 Germany	83.36	
5	 Austria	82.28	
6	 France	82.05	
7	 Norway	82.00	
8	 Czechia	81.87	
9	 Poland	81.80	
10	 Estonia	81.68	

Sustainable Development Report 2023 by United Nations

FINLAND – SAVING THE WORLD WITH WITH SUSTAINABLE SOLUTIONS IS GOOD BUSINESS

FINLAND

DECARBONIZING
INDUSTRIES /
SOCIETY

BATTERY VALUE CHAIN

DIGITALIZATION
DATA CENTERS

HYDROGEN
AND DERIVATIVES ECONOMY



CO₂ FREE
ENERGY

FINLAND -

GATEWAY INTO EUROPEAN MARKETS

**Sustainable Low Carbon
Economy aligned with
EU Green Deal**

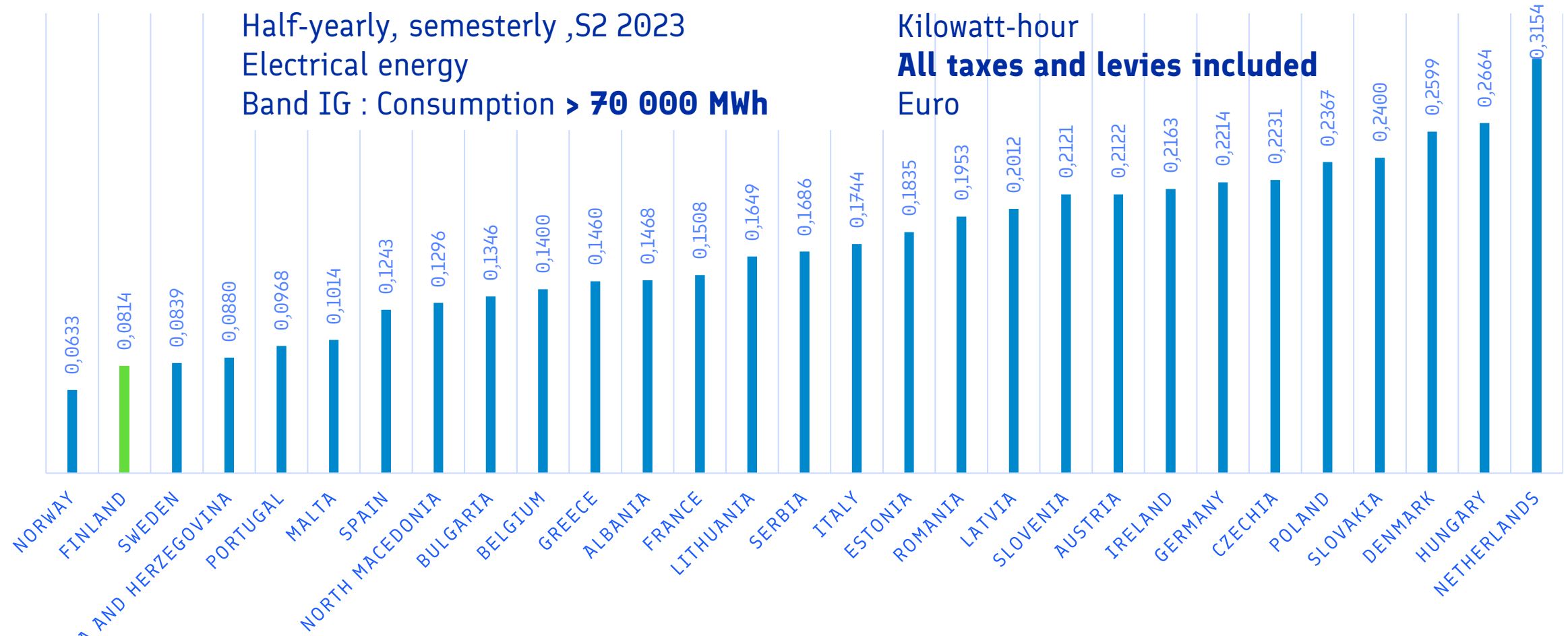


**BUSINESS
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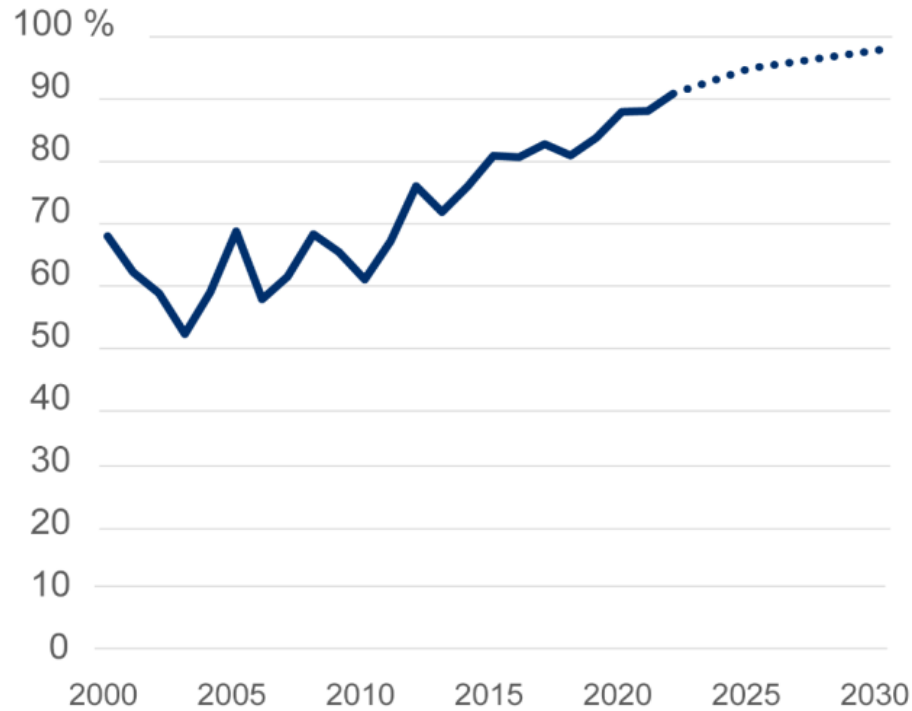
HYDROGEN ECONOMY

ELECTRICITY PRICE IN FINLAND AMONG THE LOWEST IN EUROPE





Share of zero-emission electricity in production



3 | 11.9.2023

FINLAND - RENEWABLE POWER GROWTH

Projected development of electricity generation (TWh)

Fingrid estimate, January 2024

FINGRID



FIGURE 3 Projected development of electricity generation.



94% - CO2 Free Electricity in 2023

FINLAND - 28 MT OF BIOGENIC CO₂

CARBON DIOXIDE AS A RESOURCE

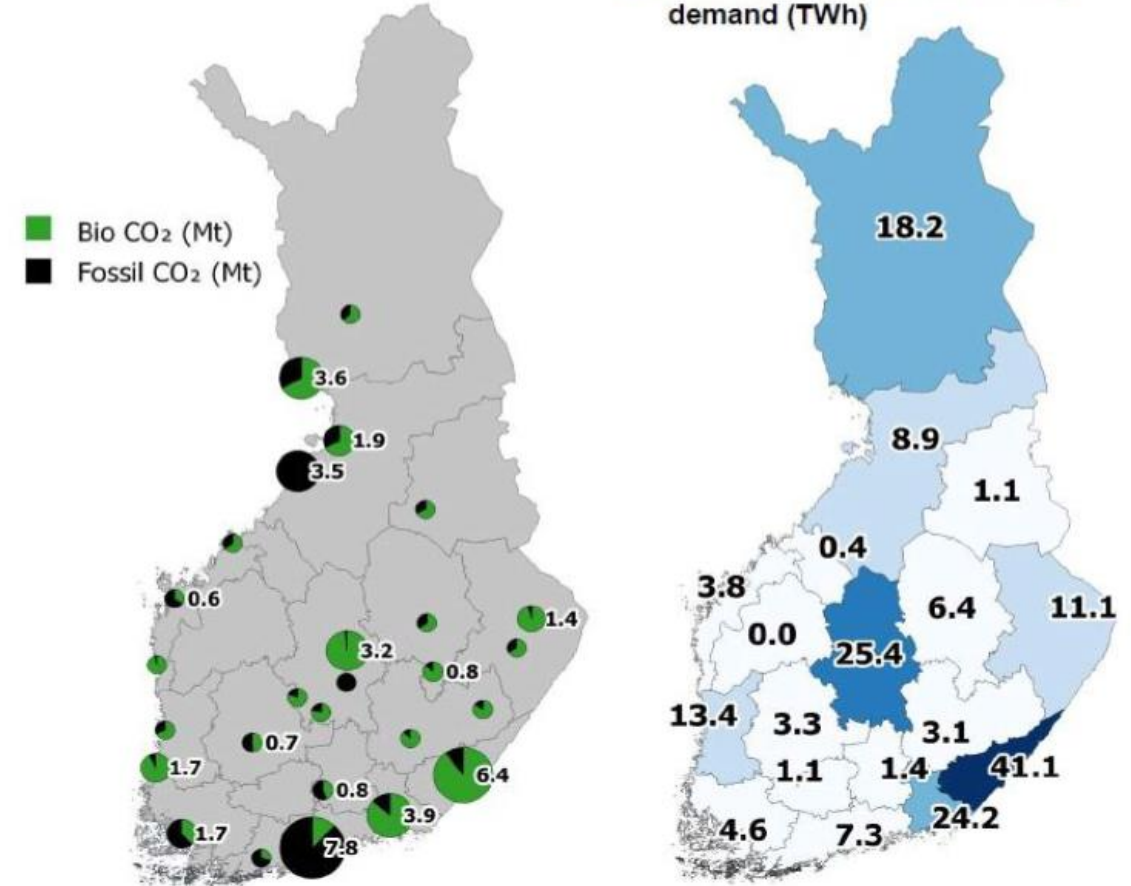
» Large point sources of CO₂ in Finland release over 41 Mt of CO₂ annually, of which over 50% originates from biomass



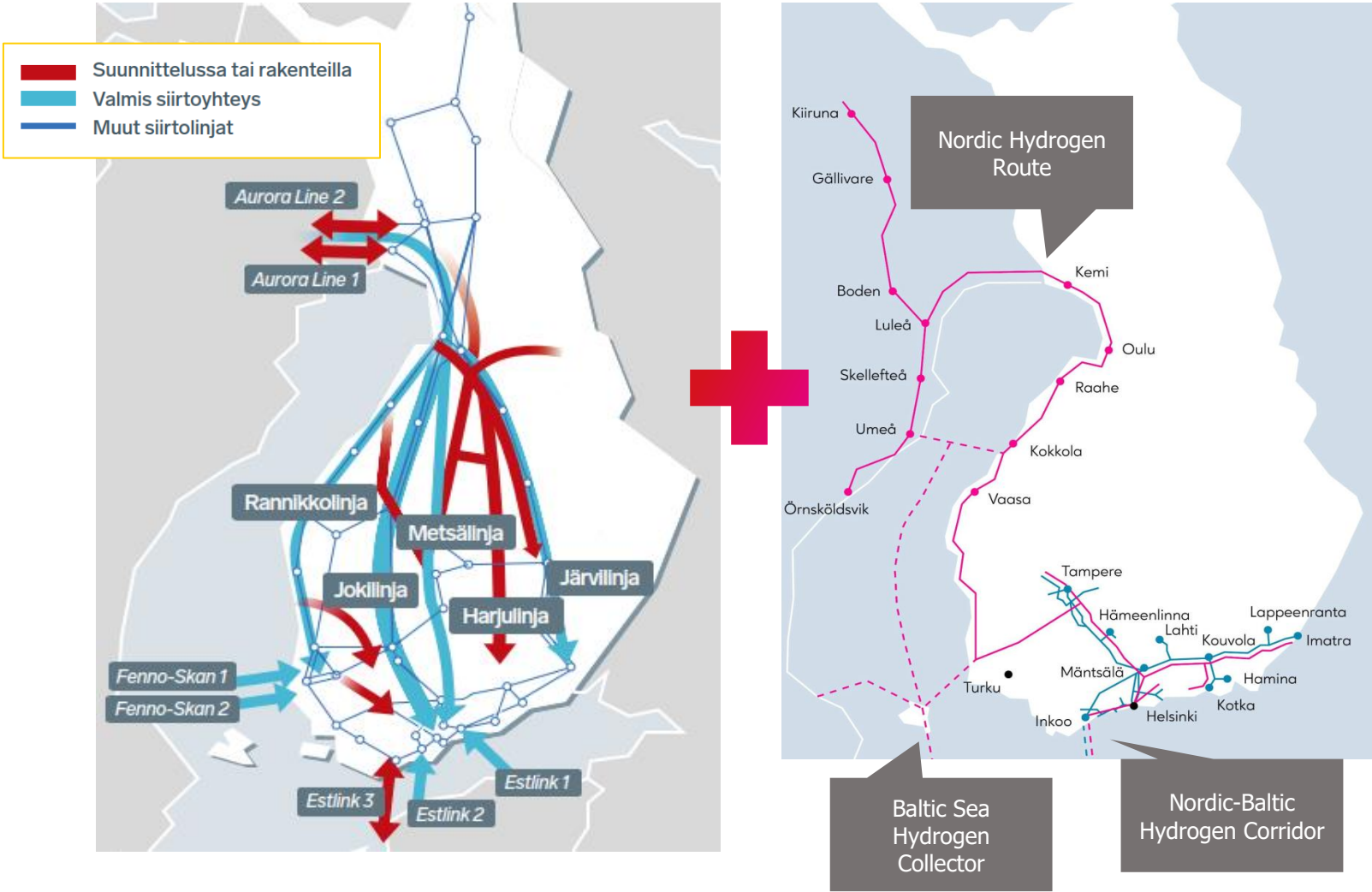
» 24 Mt bio-CO₂ } » H_xC_x
» 175 TWh_{el}



» BioCO₂ conversion electricity demand (TWh)



FINGRID AND GASGRID CO-OPERATION

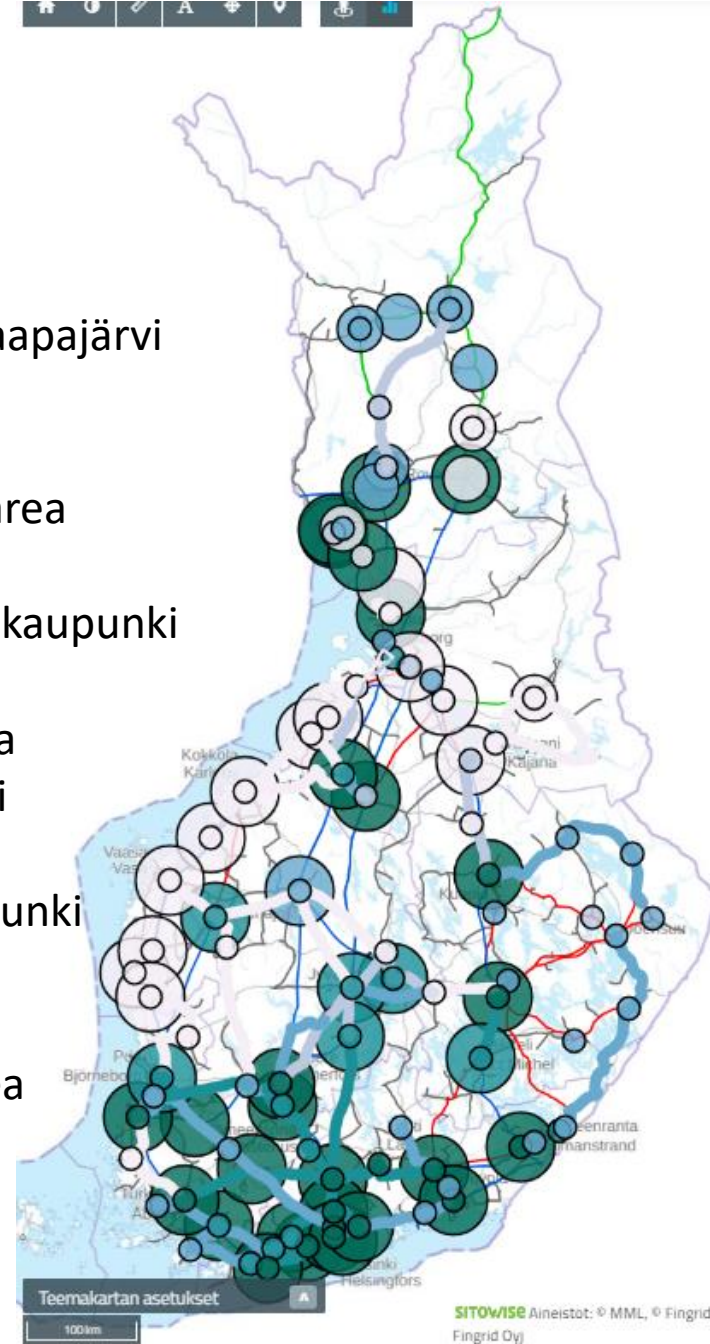


REINDUSTRIALIZATION- INDUSTRIAL CLUSTERS

ATTITUDE - ZONING, PERMITTING, POWER, LOGISTICS, SKILLS



- Tornio
- Kemi
- Oulu
- Muhos
- Nivala-Haapajärvi
- Pyhäjärvi
- Raahe
- Kokkola area
- Vaasa
- Kristiinankaupunki
- Pori
- Harjavalta
- Kokemäki
- Rauma
- Uusikaupunki
- Naantali
- Salo
- Turku area
- Inkoo
- Lohja
- Hanko



- Ranua
- Kuopio
- Joensuu
- Varkaus
- Jyväskylä
- Jämsä
- Tampere area
- Hämeenlinna
- Lahti
- Mikkeli
- Lappeenranta
- Kouvola
- Imatra
- Kotka-Hamina
- Porvoo
- Sipoo
- Helsinki
- Espoo
- Vantaa
- Ring of Industries



PROJECT DEVELOPMENT - 110 METER HURDLES BUT LONGER ...

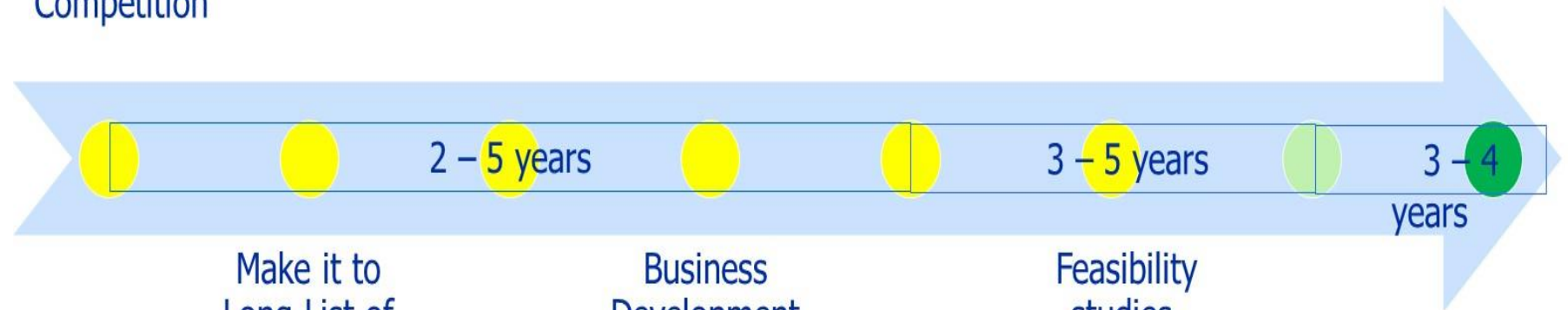
Investor Search – Markets, Know-how, Contacts, Timing, Competition

Short List of Countries and locations => Customer to visit Finland – ATTITUDE

Project Published – Finland and location selected - EIA and preparations starting

Permits Financing Final Investment Decision

Construction / Ramp-Up / Operations

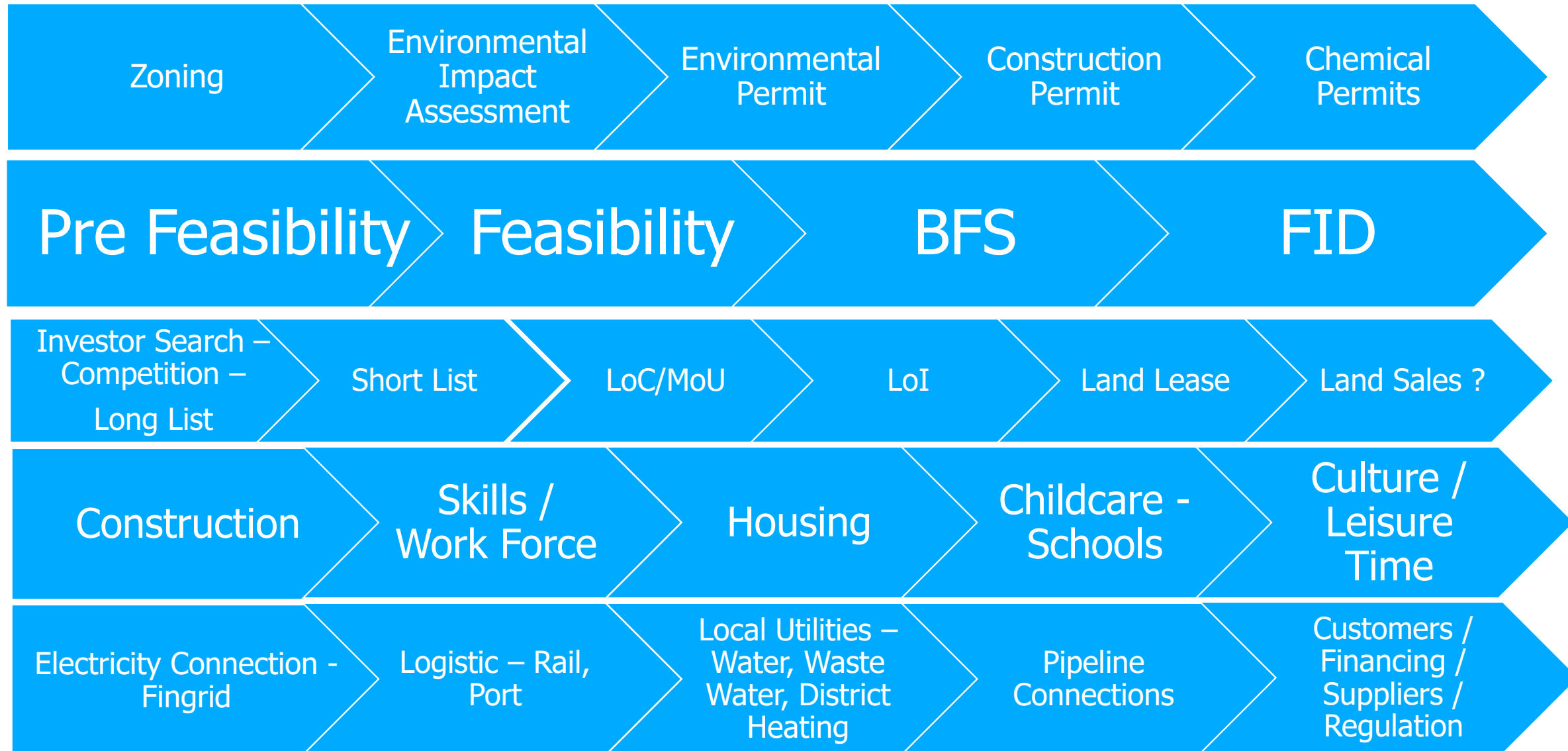


Make it to Long List of Countries and Locations

Business Development , preliminary feasibility, local decision making

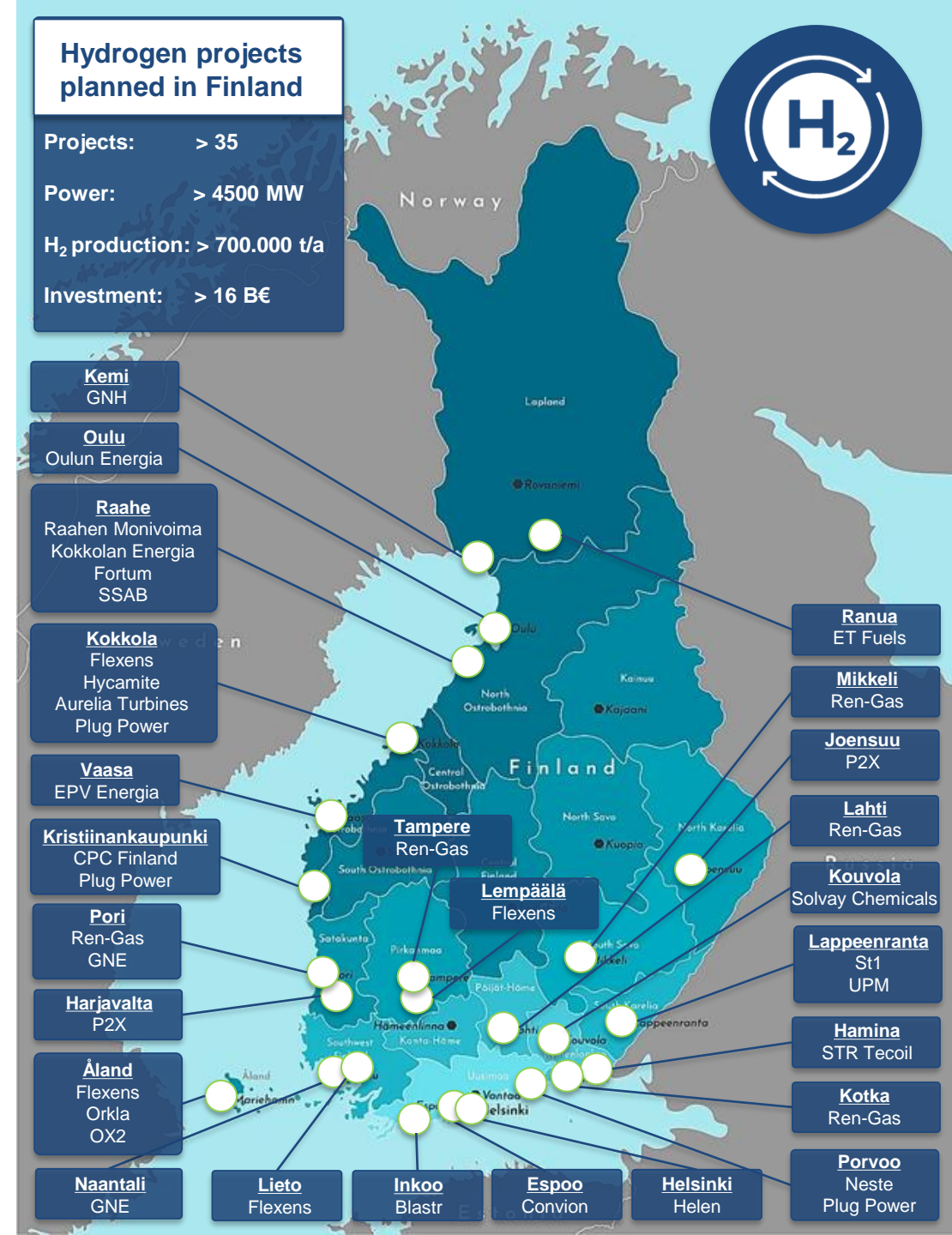
Feasibility studies, Permitting process, Off-take agreements Financing, etc.

SYNCRONIZING IT ALL - LOCAL COMMUNITY ROLE ESSENTIAL



Hydrogen projects in Finland

- In year 2023 there were more than 35 hydrogen projects planned or already under construction in Finland
- First projects to be commissioned during year 2024
- Annual hydrogen production of planned projects will be more than 700.000 tonnes
- Most of the produced hydrogen will be refined into E-fuels or other products and utilized in industry



100+ Active Hydrogen Cluster Finland members



A STRONG AND COMMITTED FINLAND - GOVERNMENT PROGRAM

6A formula for growth

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Vision

- The Government's vision is a competitive and entrepreneur-friendly Finland that attracts investments. In 2031, Finland will be the most interesting country in the world for investing and creating something new. Finland has good conditions for entrepreneurship, ownership and growth. This will generate jobs, wellbeing and prosperity for people.

Sample of actions on-going:

- Permitting review
- Industrial Policy under development
- Financial Incentives – tax credit / investment support
- Business Finland Programs - Innovation & Research



BUSINESS FINLAND – MISSION / PROGRAMS

ZERO CARBON FUTURE

DECARBONIZED CITIES

GOAL	Zero Carbon Future WHAT DO WE AIM FOR?		
	Our future wellbeing is made with Finland's global carbon handprint		
FOCUS AREAS	Energy transition in industries 	Energy transition in transport & mobility 	Energy transition in built environment
SUB GOALS	BUSINESS, INNOVATIONS, INVESTMENTS – <ul style="list-style-type: none"> New innovations for sustainable and flexible energy systems created and implemented for exports Finnish hydrogen and batteries ecosystem is globally recognized, and investments realized in Finland New innovations created for high carbon-emitting industries for value-add business OPERATIONAL ENVIRONMENT – <ul style="list-style-type: none"> Sense-making of EU's/global regulation to strengthen companies' resilience & future competitiveness Clean energy investments realized in Finland ATTITUDES & PRACTICES – <ul style="list-style-type: none"> Finland's low carbon roadmaps used effectively for visibility Zero carbon solutions also created by integrating foreign technologies <p>→ Zero Carbon energy based new high-value industries created</p>	BUSINESS, INNOVATIONS, INVESTMENTS – <ul style="list-style-type: none"> Transition enabling solutions and services developed for passenger, rail & road transportation, maritime and aviation Carbon handprint created especially in electrification, grid development, EV charging, batteries, e-fuels, digitization fields OPERATIONAL ENVIRONMENT – <ul style="list-style-type: none"> Enabling legislation and regulation influenced to secure our competitiveness and possibilities for new business Intensified Nordics collaboration for business ATTITUDES & PRACTICES – <ul style="list-style-type: none"> Global growth accelerated by strengthening collaboration with Finnish/global hotspots for research, development and deployment <p>→ Key enabling technologies & solutions decarbonize transport & mobility sector</p>	BUSINESS, INNOVATIONS, INVESTMENTS – <ul style="list-style-type: none"> International partner cities reached their targets via jointly developed and tested solutions in energy and transportation Increased EU funding to Finland (EU 100 cities mission) OPERATIONAL ENVIRONMENT – <ul style="list-style-type: none"> Thought leadership in global/EU platforms for positive business environment development By increased global awareness, Finnish solutions scale-up faster ATTITUDES & PRACTICES – <ul style="list-style-type: none"> Increased born global attitude through market shaping via city partners <p>→ Portfolio of unique city solutions generate new export</p>

DECARBONIZED CITIES 2023 – 2028

FINNISH SOLUTIONS DECARBONIZE CITIES WORLDWIDE BY BOOSTING COMPREHENSIVE ENERGY TRANSITION

CUSTOMERS

- FI companies
- R&D organizations
- Universities
- Finnish Cities
- International Cities

GLOBAL MARKET OPPORTUNITIES

- Los Angeles
- Singapore
- Madrid
- Bodø/Norway
- Other European cities

SERVICES

- Market Advice
- Business Opportunities
- RDI Funding&Projects
- EU Funding
- Events&Networking
- Business Delegations

DIGITALIZATION AS THE KEY ENABLER

DECARBONIZED CITIES

HYDROGEN & BATTERIES – DUAL HELIX OF DECARBONIZATION

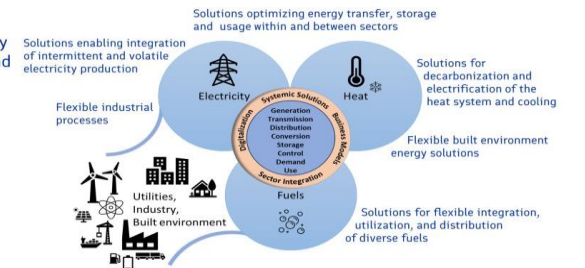
Flexible Energy Systems Business Finland Program 2024-2030

Flexible Energy Systems program facilitates future looking innovations and promotes Finnish solutions increasing flexibility of the energy system, with the aim to significantly strengthen the export industry, increase exports globally and bring in investments.

The scope covers solutions increasing flexibility and interconnecting the energy sectors; electricity, heat and fuels.

Flexible Energy Systems is a collaboration program with Research Council of Finland.

Save the date: Launch event 10.10.2024, 9:00-13:30, in TF-House, Ruoholahti.



FINLAND SUCCESS MADE OF FIVE S's

SUSTAINABILITY
SKILLS
SPEED
SCALE
SISU

SAVING THE WORLD IS GOOD BUSINESS - LET'S DO IT TOGETHER

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