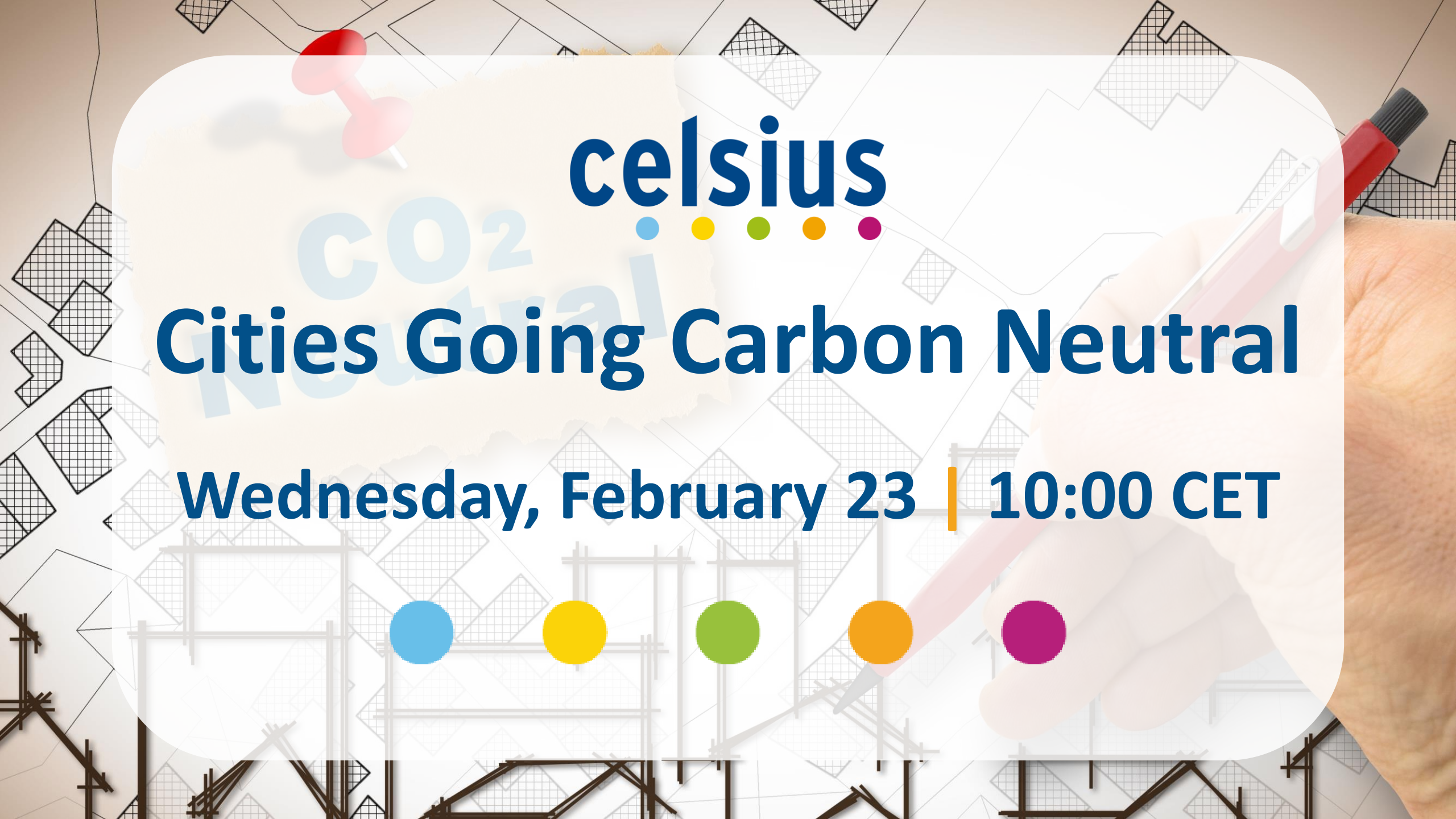




celsius

Cities Going Carbon Neutral

Wednesday, February 23 | 10:00 CET



Moderator

Aksana Krasatsenka

Euroheat & Power

Cities Going Carbon Neutral



Funded by the European Union's
Horizon 2020 Programme



100 Climate-Neutral and Smart Cities by 2030



Funded by the European Union's
Horizon 2020 Programme





Cities Going Carbon Neutral



Aksana Krasatsenka

Euroheat & Power

Moderator



Markus Paulsson

Cool DH

City of Lund, Sweden



Allan Pilgaard-Jensen

ProjectZero

Sonderborg, Denmark



Peter Lichtenwöhre

City of Vienna, Austria



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Markus Paulsson

Cool DH

City of Lund, Sweden

The world's largest LTDH grid in Lund



Funded by the European Union's
Horizon 2020 Programme



The world's largest LTDH grid – in Lund

Markus Paulsson

Energy strategist

City of Lund



CITY OF
LUND



Founded 990 AD
127 000 inhabitants
Growing population: +45% since 1990
University >40 000 students
Target: -50% CO₂-eq 1990-2020 (reached 2018)

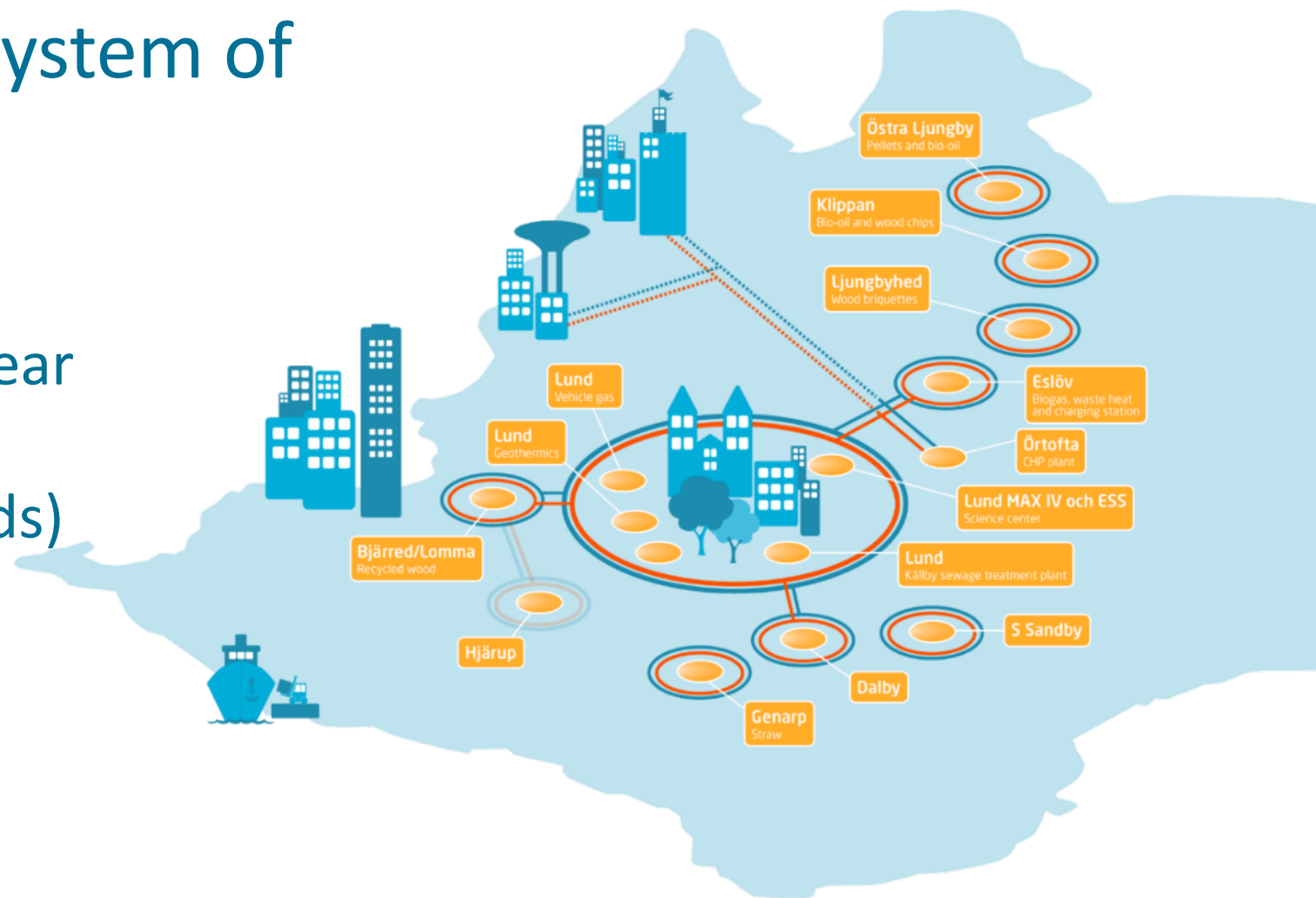


Brunnshög district



The 3rd generation DH system of Kraftringen

- Heat production:
 - Kraftringen: ≈ 970 GWh/year
 - Total: $\approx 1\,100$ GWh/year (approx. 50 000 households)
- Kraftringen grid length (one way): $\approx 1\,050$ km
- 100% fossil free



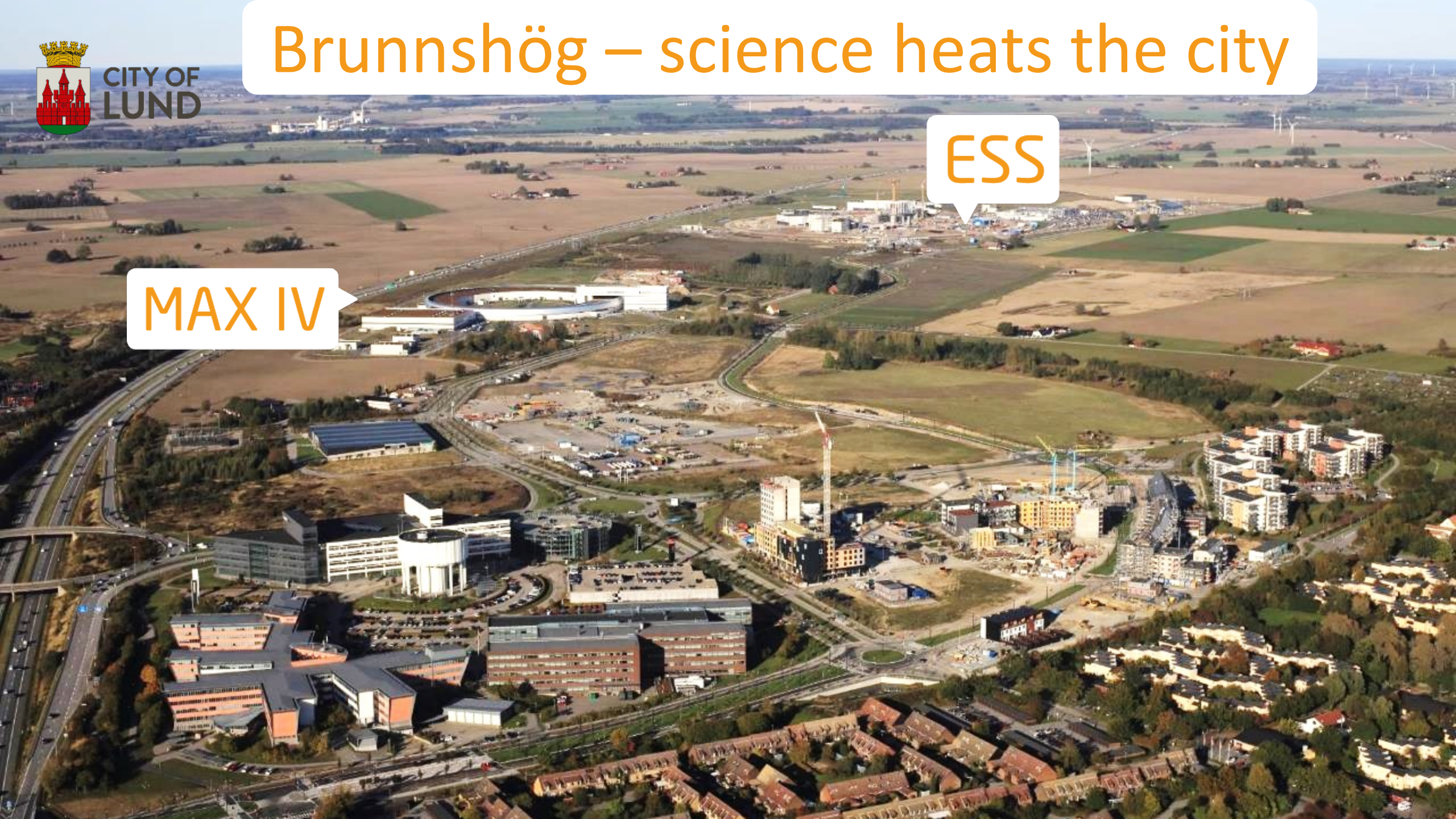


CITY OF
LUND

Brunnshög – science heats the city

MAX IV

ESS





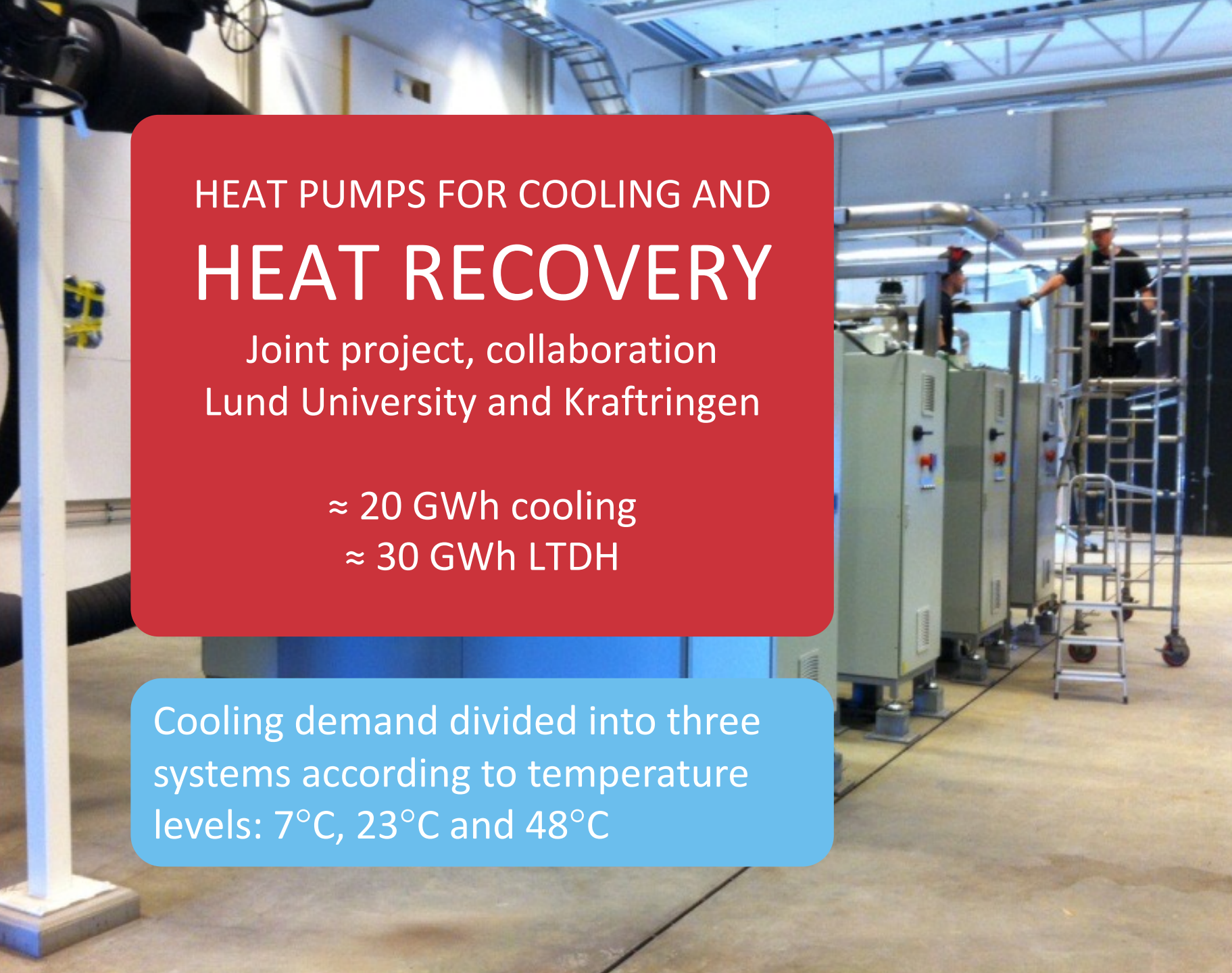
CITY OF
LUND

The world's largest
research facility with
synchrotron radiation

MAX IV

- Cooling and heating supply
- Recycling of excess heat

Energy
central

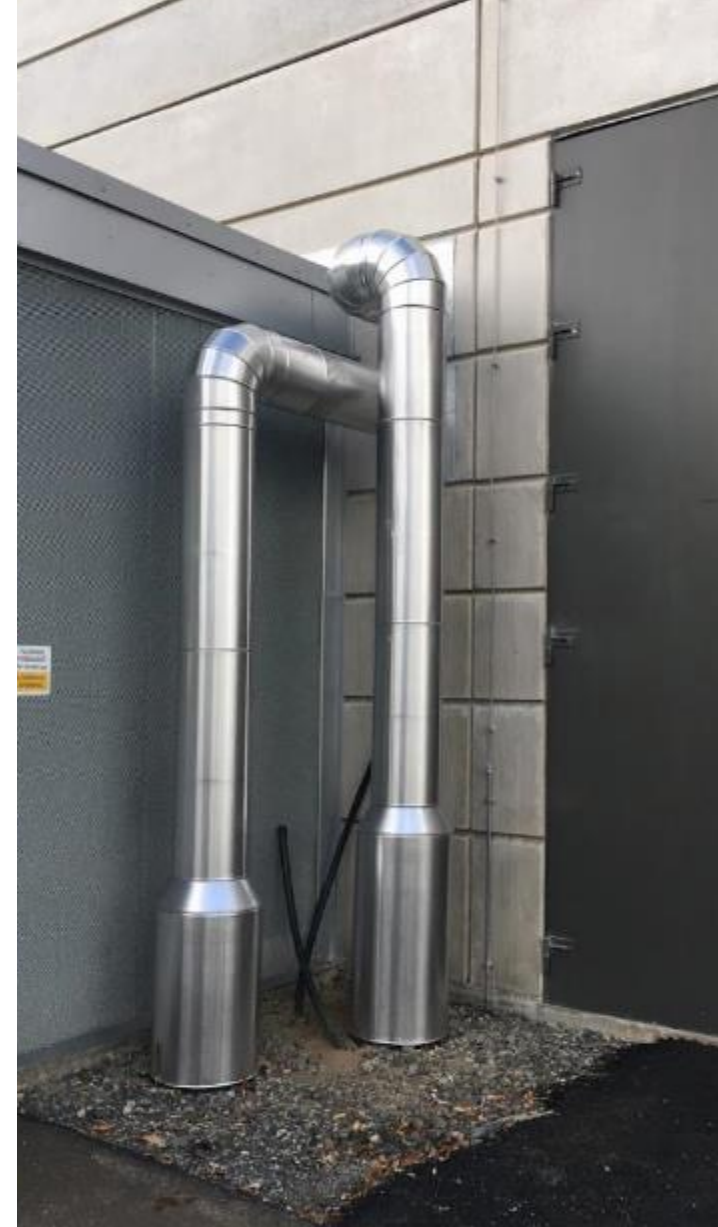


HEAT PUMPS FOR COOLING AND HEAT RECOVERY

Joint project, collaboration
Lund University and Krafringen

≈ 20 GWh cooling
≈ 30 GWh LTDH

Cooling demand divided into three
systems according to temperature
levels: 7°C, 23°C and 48°C



Low temperature district heating grid in Lund

- Heat from MAX IV is recovered and used in LTDH network (65 °C), backed by modern DH production (>80 °C)
- 65 °C (+/- 2 °C) and 10 Bar
 - Adapted to low energy buildings
 - Legionella safe
 - Lower production costs
 - Lower heat losses
 - Heat distribution partially in plastic pipes





Denmark, Høje Taastrup
Høje Taastrup C and Østerby

Sweden, Lund
Brunnshög

Final conference
18-19 May 2022
www.cooldh.eu



Thank you for your attention

Global
District
Energy
Climate
Award



www.cooldh.eu

#cool_dh

Markus Paulsson, Lund

Sara Kralmark, Krafringen



Allan Pilgaard-Jensen

ProjectZero

Sonderborg, Denmark

How to reach carbon neutral district heating in Sonderborg by 2029



Funded by the European Union's
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Cities going carbon neutral

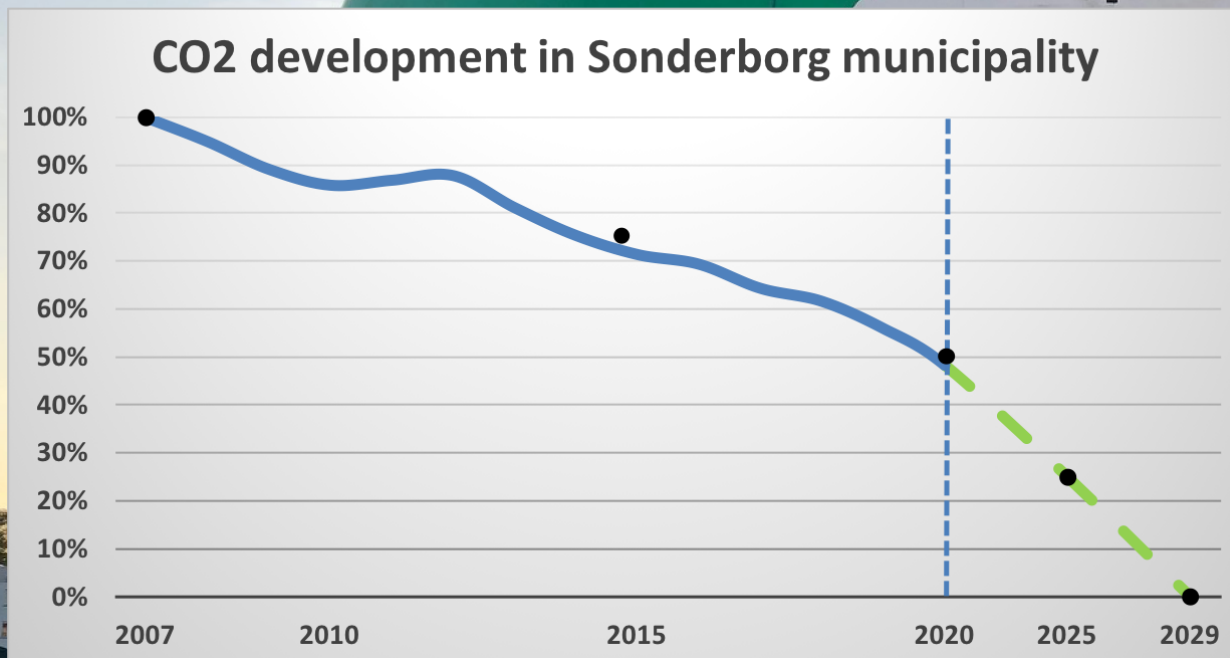
How to reach carbon neutral district heating in Sønderborg by 2029

Celcius webinar - February 23, 2022 - Allan Pilgaard-Jensen, ProjectZero



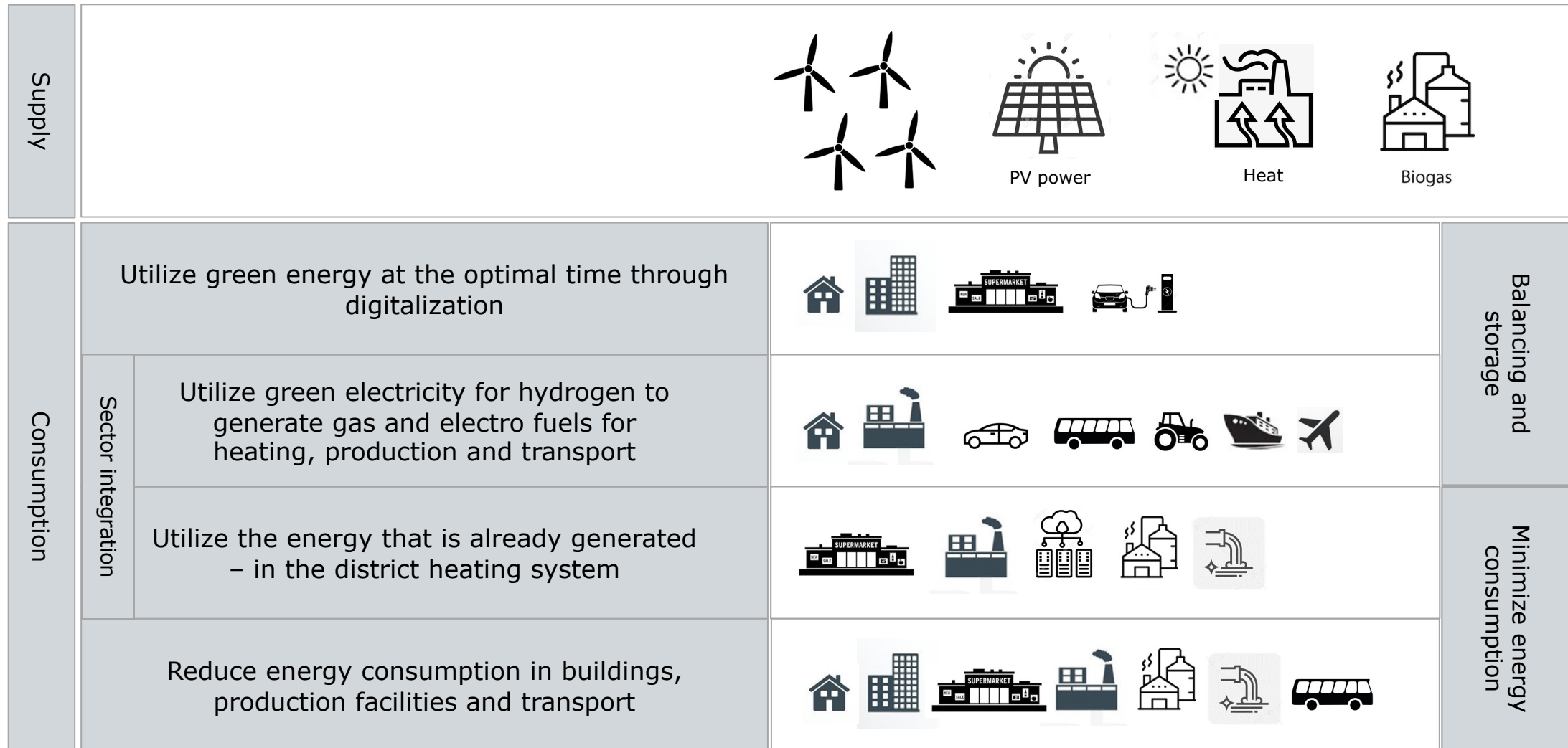
ProjectZero
SONDERBORG

Target: CO2 neutral energy system by 2029

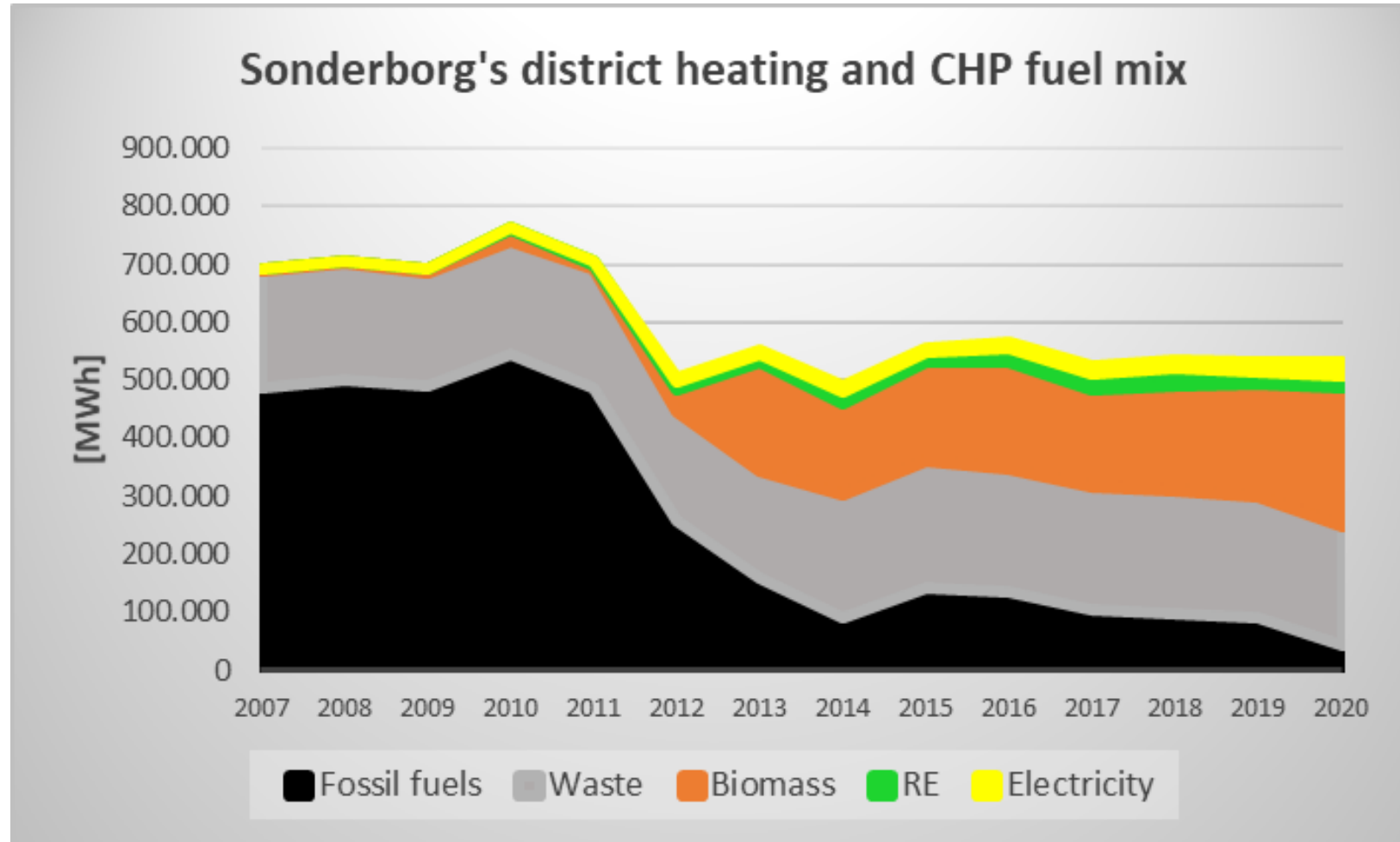


ProjectZero
En verden til forskel

The smart way to a CO2 neutral energy system

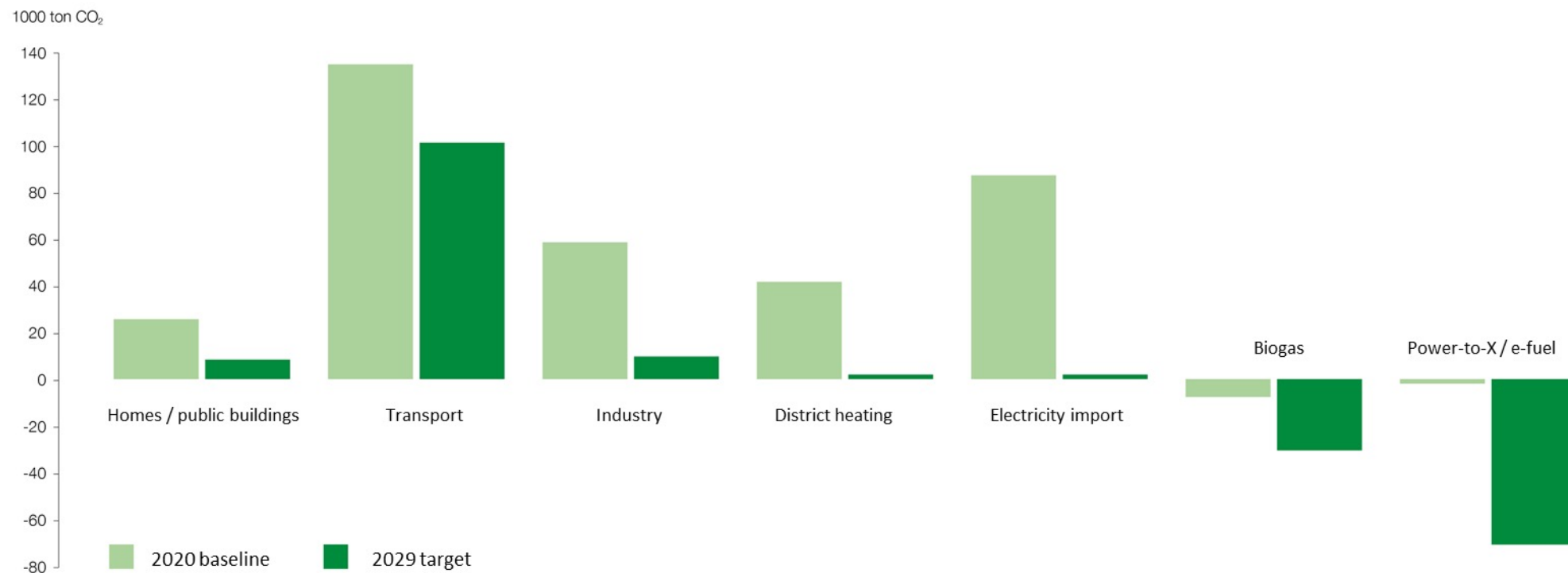


CHP and DH fuel distribution in Sonderborg 2007-2020



The overall plan for reaching CO2 neutrality in 2029

CO2 reduction per sector – 2020-2029

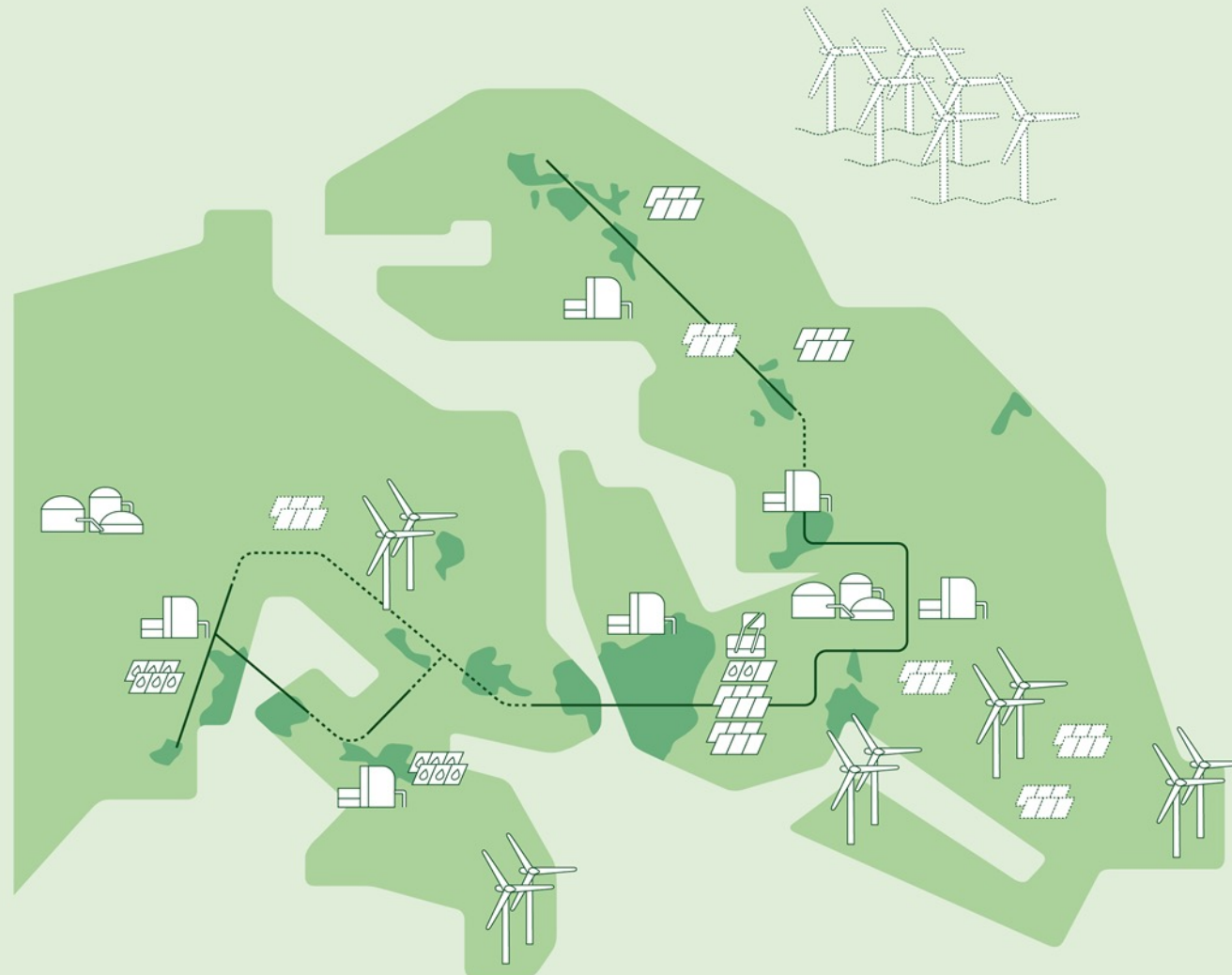


A cost-efficient, integrated energy system

Utilize excess heat in the district heating system

Biogas replaces fossil gas and plays key role in Power-to-X / e-fuels

Power-to-X / e-fuels where battery-powered transport is inadequate



Massive need for wind and solar power

Intelligent solutions for utilizing the grid infrastructure efficiently

Intelligent heating of buildings





Peter Lichtenwöhre
City of Vienna, Austria

A journey towards carbon neutrality in the heating sector



Funded by the European Union's
Horizon 2020 Programme



A journey towards carbon neutrality in the heating sector

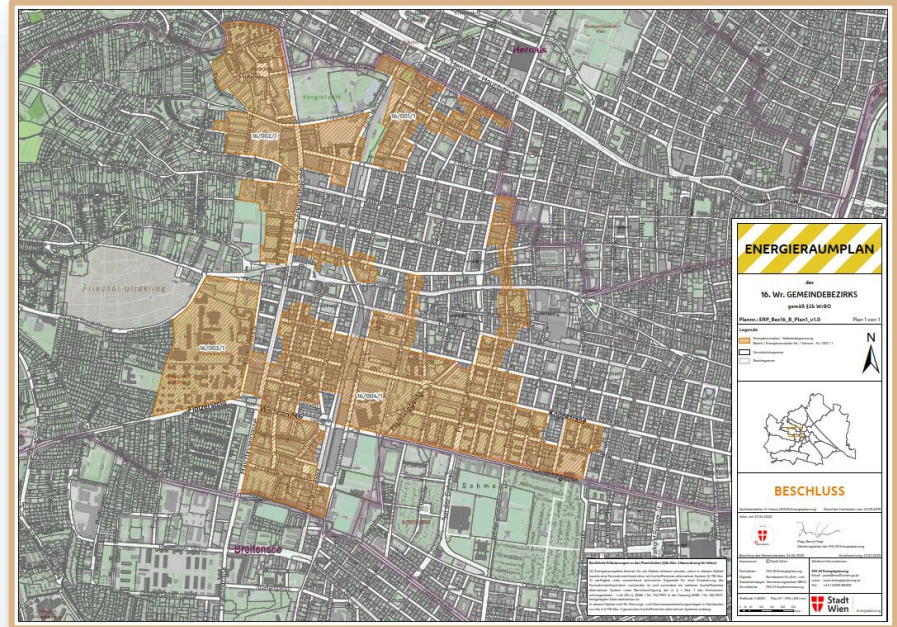
Peter Lichtenwöhrer,
Energy Planning in Vienna



Past

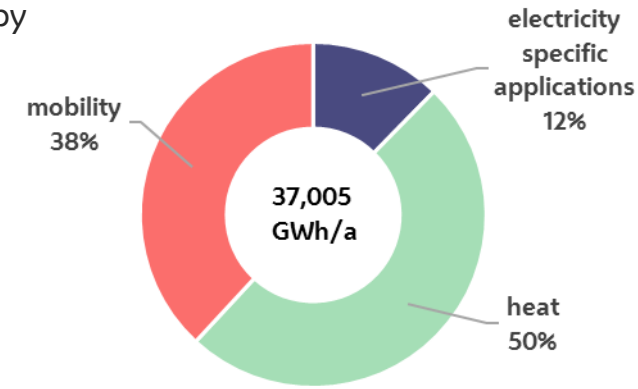
What has been established?

- Understanding the heating sector in Vienna
- New Coalition Agreement: Decarbonisation until 2040
- Energy Zoning Planning "1.0" →
- Basic research on energy(geo)data
- Cooperation in local working groups with network operators/energy suppliers
- Work in research projects

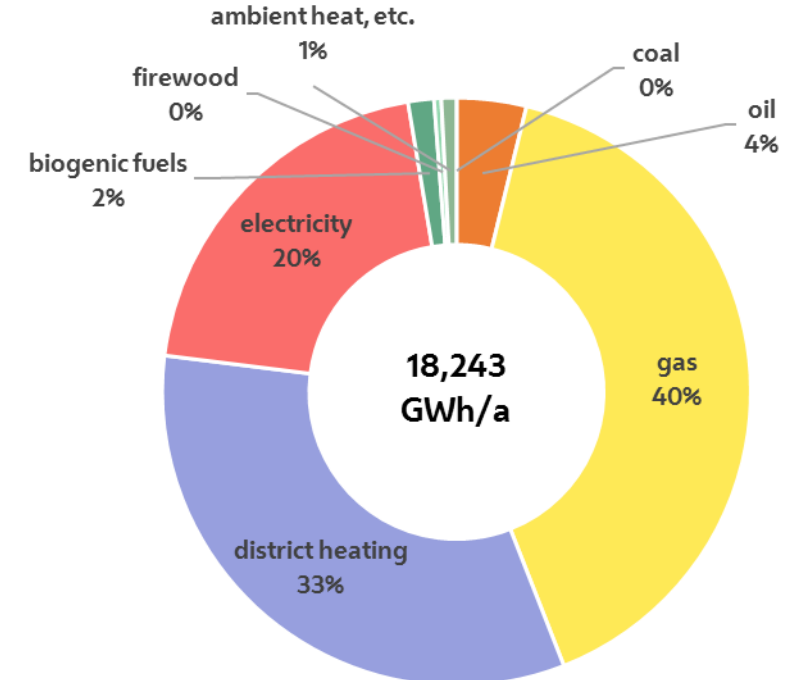


Source: Energieraumplan des 16. Wr. Gemeindebezirks
(<https://www.wien.gv.at/stadtentwicklung/energie/erp/aktuell.html>)

Final energy consumption by application:



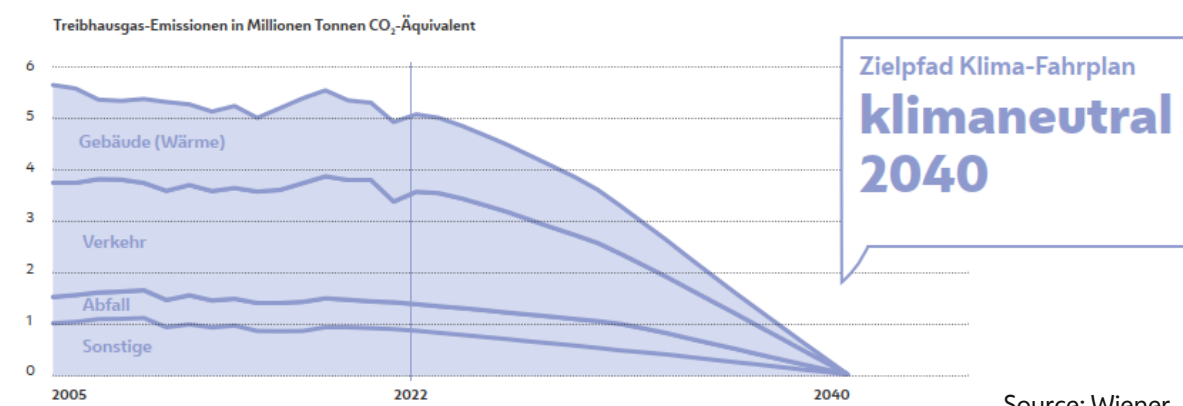
Heat consumption by energy sources:



Source: Energy Report of the City of Vienna (2021)

Present

What are we working on right now?



- **Climate Roadmap**
 - Climate protection and climate adaptation
 - Shared vision and shows the way from theory to implementation
- **Decarbonisation Concept Vienna Heating & Cooling 2040**
 - District heating and renewable forms of heating
 - Technical, planning, legal, financial and social issues



Future

What is ahead?

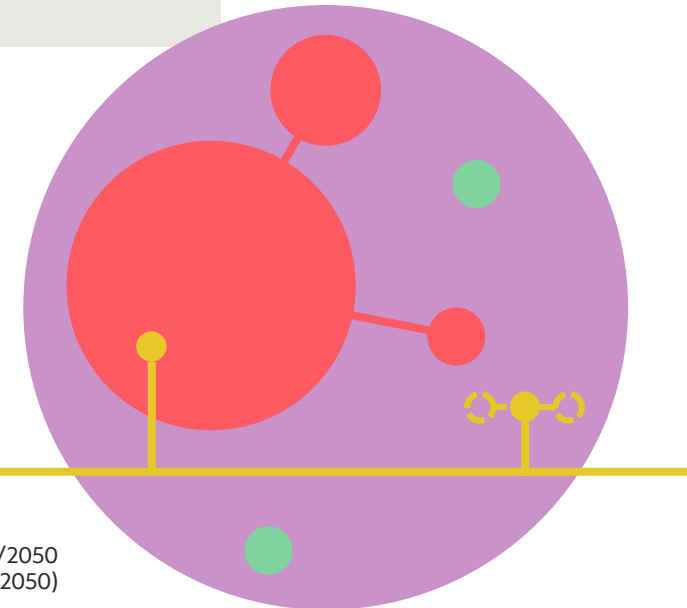
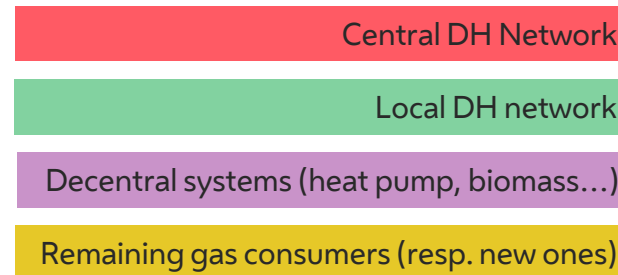


© Peter Lichtenwöhner

- Decarbonisation of the building stock
- Energy Zoning Planning "2.0"
- Follow other forerunners (e.g. via research projects)

Why? What? When? How?

(from the Heat Transition Strategy in Rotterdam)



Source: Heating/Cooling Outlooks 2030/2050
(Decarb City Pipes 2050)



**City of
Vienna**

A journey towards carbon neutrality in the heating sector



Thank you!

DI Peter Lichtenwöhrer

Municipal Department 20 – Energy Planning

Rathausstraße 14-16, 3rd floor, 1010 Vienna

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www.wien.gv.at/english/environment/energy

wien.gv.at

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**City of
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Stakeholder survey!



Give your opinion on the levers and technologies for the heat transition in cities



<https://celsiuscity.eu/stakeholder-survey-urban-heating-and-cooling-transition/>



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Policy workshop – 17 March, Brussels

Survey results will be presented

<https://celsiuscity.eu/events/rewardheat-celsius-policy-workshop/>



Are you interested in

**POLICIES & INNOVATIVE SOLUTIONS
FOR EFFICIENT DISTRICT HEATING?**

NEW DATE Join us on **March 17th**
TownHall Europe, Square de Meeûs 5-6, Brussels

Interreg
CENTRAL EUROPE
ENTRAIN
European Union
European Regional
Development Fund

TEMPO

REWARDHeat

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The Celsius Forerunner Groups



Bringing together
city representatives and experts
to help cities overcome their
heating and cooling challenges.



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Spring 2022 – final round!



Fossil Free



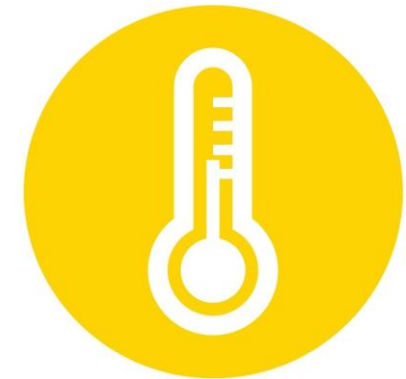
9 Mar – RES into the heat network
30 Mar – Geothermal DHC
4 May – Future of gas CHP
1 Jun – Environmental and Carbon markets challenges



Cooling

16 Mar – Award winning DHC
13 Apr – Cool technological solutions
18 May – Customer engagement to improving efficiency

Low Temperature



23 Mar – Original urban heat sources
27 Apr – Heat source prioritisation
25 May – Seasonal Thermal Storage
29 Jun – Stakeholder engagement to lower the temperature



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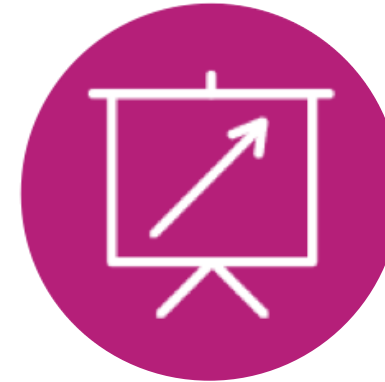


Spring 2022 – final round!



Waste Heat

- 23 Mar** – Original urban heat sources
tbc – Technological developments for WH recuperation
27 Apr – Heat source prioritisation
11 May – Engaging with WH owners
25 May – Seasonal Thermal Storage



Financing

- May/June** – tbc (CFG members Finance colleague focus)
- Green Bonds
 - Finding the right funding: public, private or combined
 - Financing masterclass with Smart Cities Marketplace



How to join us



- ✓ To join one or several Forerunner Groups, please get in touch at celsius@johannebergsciencepark.com
- ✓ Or type your contact details in the chat





Thank you!

www.celsiuscity.eu – celsius@johannebergsciencepark.com - [@celsiuscity](https://twitter.com/celsiuscity)



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