

# The AIVP Days

Dublin - Ireland  
28 - 30 May 2015

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General Assembly  
and the AIVP Days

## “Working Waterfront”: a City-Port mix in progress

In partnership with:



**PANEL 4: WORKING WATERFRONT, A SPACE FOR GREEN INNOVATIONS**

Friday, 29 May 2015 - 11:30 - 13:00

Jonas is now a Senior Program Manager and Assisting Coordinator for the Celsius Project. Prior Jonas has been working since 2008 as Director of Renewable Electricity at Göteborg Energi. He was earlier responsible for the AMR (Automatic Meter Reading) services for District Heating, District Cooling, and Gas and Electricity and prior to that he managed with electricity contracts and portfolios for large customers. Jonas has a Master's Degree in Electrical Engineering.(M.Sc.EE).



**Jonas COGNELL**

Senior Program Manager, PMO  
Göteborg Energi AB, Sweden



**GÖTEBORG (SUEDE) :  
CHAUFFAGE URBAIN ET NAVIRES,  
UN SYSTEME ENERGETIQUE  
NOUVEAU ET INNOVANT**

Le ferry Stena Danica appartenant à la compagnie Stena Line est le premier navire en service régulier à être relié à un réseau de chauffage urbain.

D'une capacité de 2275 passagers, le Stena Danica assure la liaison entre Göteborg et Fredrikshavn 650 fois par an. Dans le cadre d'un projet de démonstration révolutionnaire, le navire n'utilise plus de chaudière à mazout mais se raccorde au réseau de chauffage urbain local à son arrivée au port de Göteborg.

Selon les estimations, le passage du mazout au chauffage urbain devrait permettre de réduire les émissions de CO2 de 500 tonnes par an (-60%). Il contribuera aussi à améliorer sensiblement la qualité de l'air à Göteborg en réduisant les émissions de SOx et NOx des navires de plus de 90 % par an. Enfin, et ce n'est pas le moins important, il permettra également de diminuer les nuisances sonores dans le voisinage.

Ce projet de démonstration, qui s'inscrit dans le projet CELSIUS, est financé par le septième programme-cadre en matière de recherche de l'UE et a été réalisé en étroite coopération entre Göteborg Energi, Stena Line et la Ville de Göteborg.



**GOTEBORG (SWEDEN): DISTRICT  
HEATING TO SHIPS - A NEW,  
INNOVATIVE USE OF DISTRICT  
ENERGY FOR THE FUTURE**

The Stena Line-owned passenger ship Stena Danica is the world's first ship in regular service connected to a district heating grid.

Stena Danica has a capacity of 2275 passengers and operates the route Gothenburg - Fredrikshavn 650 times each year. Through a ground breaking demonstration project, it is connected to the local district heating grid when it arrives to port in Gothenburg instead of being heated by the previously used oil fired boilers.

It is estimated that the switch from light oil to district heating will reduce the CO2 emissions by as much as 500 tonnes per year (-60%). It will also contribute to a significantly better air quality in Gothenburg as it reduces the ships' levels of SOx and NOx with more than 90 % annually. Last but not least it will also reduce the levels of noise in the neighbourhood.

This pioneering demonstration scheme is part of the CELSIUS project, which is funded by the EU's Seventh Framework Programme for research. The demonstration project has been carried out in close cooperation between Göteborg Energi, Stena Line and the City of Gothenburg.



**GOTEMBURGO (SUECIA):  
CALEFACCIÓN URBANA Y  
NAVÍOS, UN SISTEMA  
ENERGÉTICO NUEVO E  
INNOVADOR**

El buque de pasajeros Danica, de propiedad de Stena Line, es el primer barco del mundo en servicio regular conectado a una red de calefacción urbana.

El Stena Danica posee capacidad para 2275 pasajeros y opera la ruta Gotemburgo-Fredrikshavn 650 veces al año. A través de un innovador proyecto de demostración, se conecta a la red de calefacción urbana cuando llega al Puerto de Gotemburgo en vez de calefaccionarse con las calderas a petróleo utilizadas anteriormente. Se calcula que el cambio de petróleo liviano a calefacción urbana reducirá las emisiones de CO2 en hasta 500 toneladas/año (-60%). También va a contribuir en gran medida a mejorar la calidad del aire de Gotemburgo ya que reduce las emisiones de SOx y NOx del barco en más de un 90% anual. Por último, pero no menos importante, disminuirá además los niveles de ruido en el vecindario.

Este esquema de demostración pionera forma parte del proyecto CELSIUS, financiado por el Séptimo Programa Marco de Investigación de la Unión Europea. El proyecto de demostración se llevó a cabo mediante la cooperación de Göteborg Energi, Stena Line y la Ciudad de Gotemburgo.

Dublin (Ireland), 28-30 may 2015

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The AIVP Days



# District heating to ships

– A new, innovative use of district energy for the future.

*Jonas Cognell ,  
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Assisting Coordinator, Celsius, Smart Cities  
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This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 314441.



# Agenda

- Presentation of Göteborg Energi
- The Celsius Project (to set the scope)
- Demonstrators.
- District Heat to Ship (STENA Danica)
- Questions



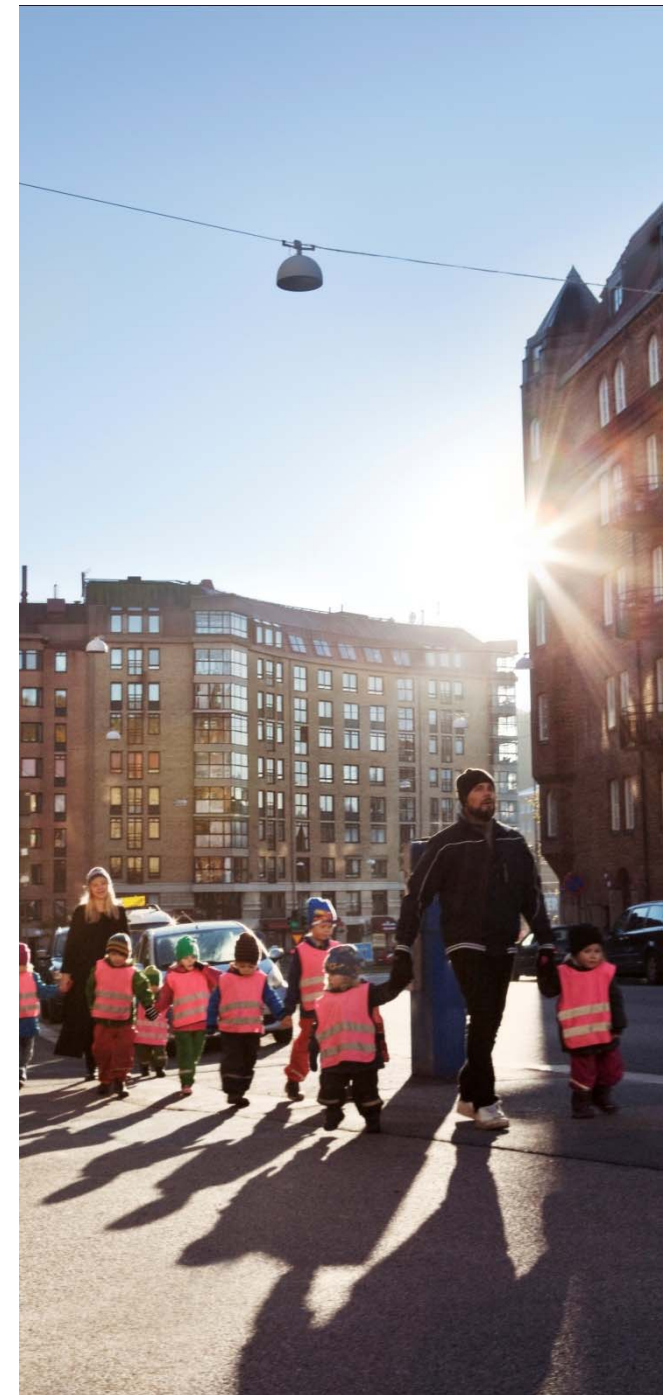


Where is Gothenburg ?



## Göteborg Energi Figures 2014

Owner	City of Göteborg
Customers	approx. 300 000
Employees	approx. 1 060
Income	650 MEUR
Earnings	30 MEUR
Investments	70 MEUR
Total assets	1300 MEUR



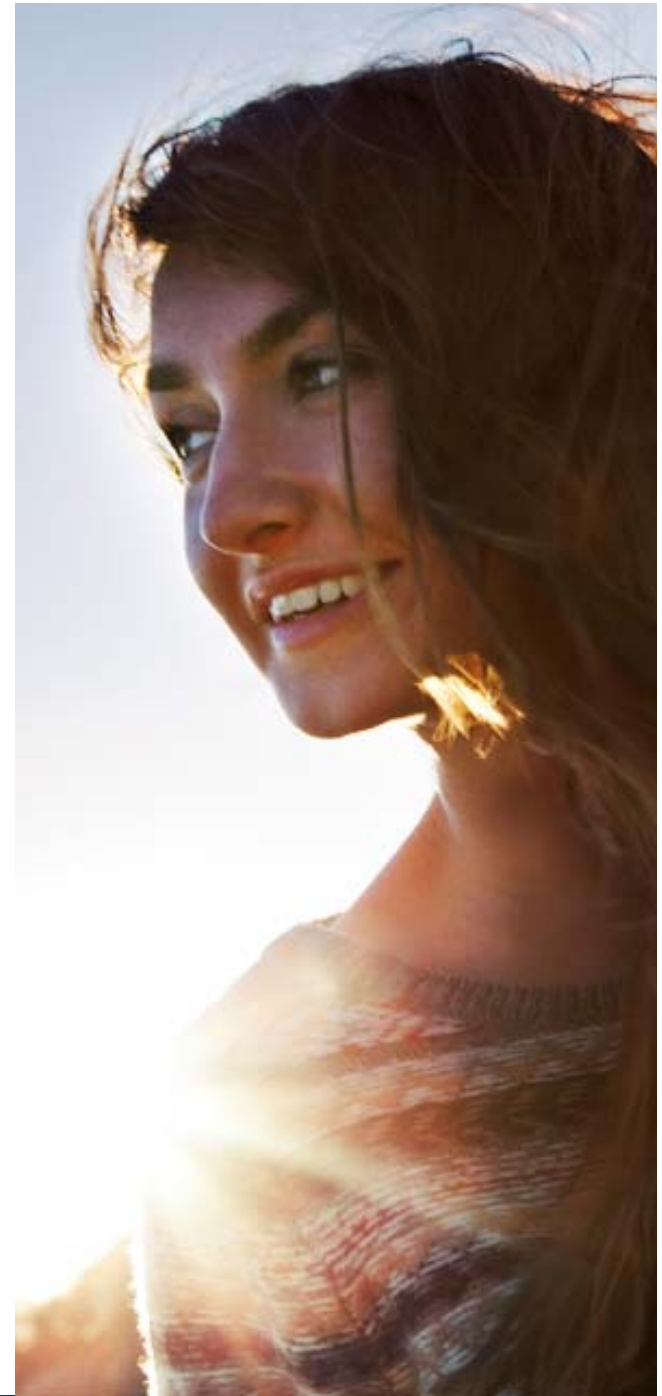
## District Heating

- Our district heating system now supplies heating to 90 percent of the apartment blocks in Gothenburg.
- 95 percent of our district heating is obtained from co-generated, recycled and renewable energy sources.
- The remaining heating is produced in plants that primarily burn biofuels. Oil is used when temperatures are very low.
- Sulphur emissions are close to zero and emissions of nitrogen oxides have fallen by around 90 percent since 1985.



## A Complete Energy Company

- District heating
- District cooling
- Energy services
- Electricity supply grid
- Electricity trading
- Renewable energy (wind power, biogas)
- Gas trading
- Gas distribution
- Broadband/networks
- Research & Development







# Göteborg Energi

- A TOOL FOR SUSTAINABEL CITY DEVELOPMENT

## Owner Directives

”By owning Göteborg Energi, the city wants to integrate and develop the energy operations in the city development and contribute to the development of a sustainable Gothenburg society.

Furthermore, the purpose is to assure security of supply and reasonably priced energy for citizens and companies....”



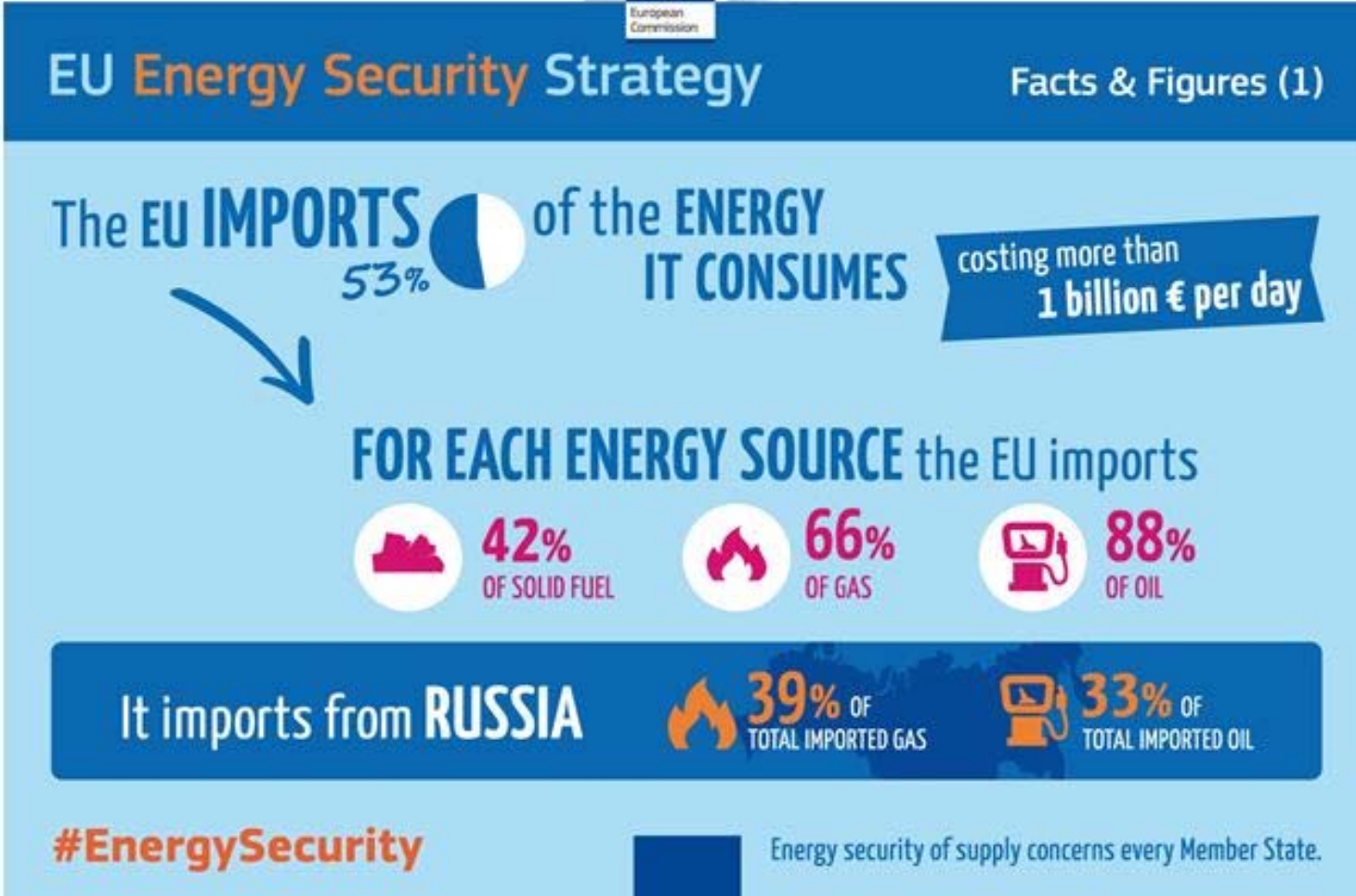
# About the CELSIUS Project

- Gothenburg, London, Genoa, Cologne, Rotterdam
- 20 partner organizations
- April 2013 – Mars 2017
- 10 new demonstrators + 20 existing demonstrators
- 7 replication cities
- 50 new Celsius-cities
- Total budget 26 MEUR (EU contribution 14 MEUR)





# EU Trade balance





# New CELSIUS Cities

1

## Early communication

- engaging with potential CELSIUS Cities

2

## Status of the city

- fill out New CELSIUS city questionnaire

3

## Support need identification

- discussion between project and city

4

## Letter of Commitment

- the city commits to become a CELSIUS City

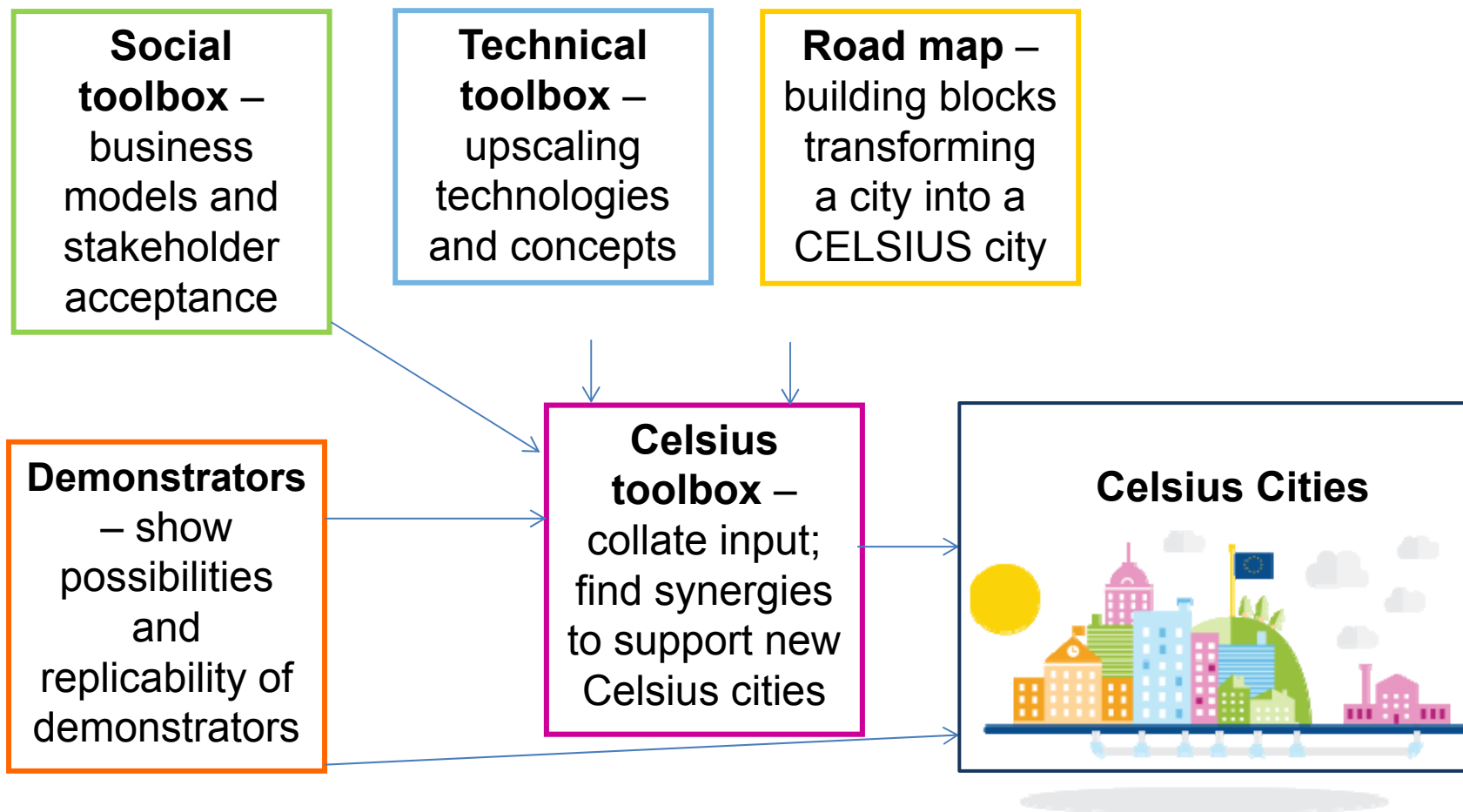
5

## Offerings

- demonstrators, toolboxes, workshops and expert group



# Support to new CELSIUS Cities



# Demonstrator inaugurations



Cologne, October, 2013  
District heating from sewage  
water



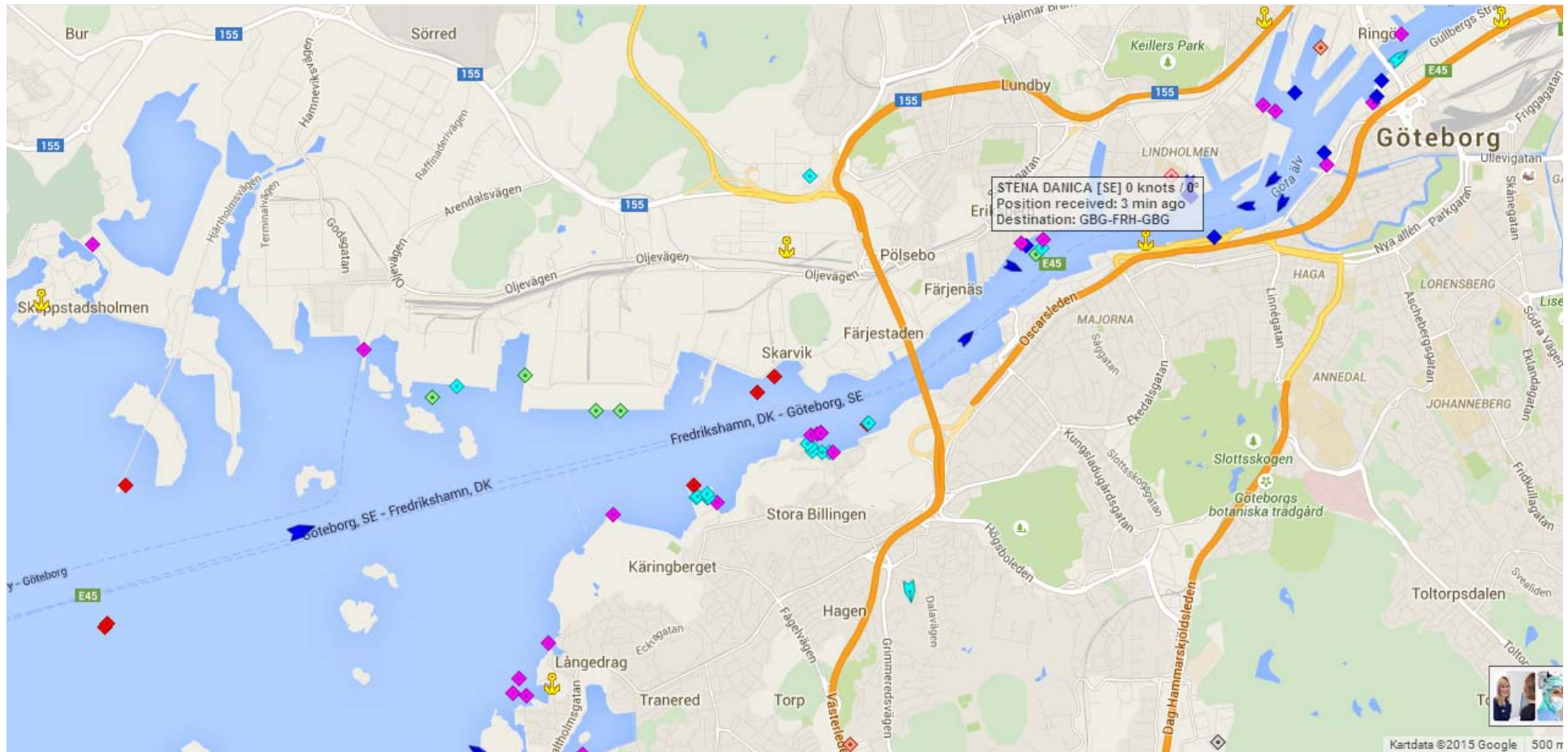
Rotterdam, April, 2014  
Heat hub, 300 MWh/50 MW



Gothenburg, December, 2014  
District heating to ships



# Ariel view of the docking point to the ship



Source: [www.marinetraffic.com](http://www.marinetraffic.com)





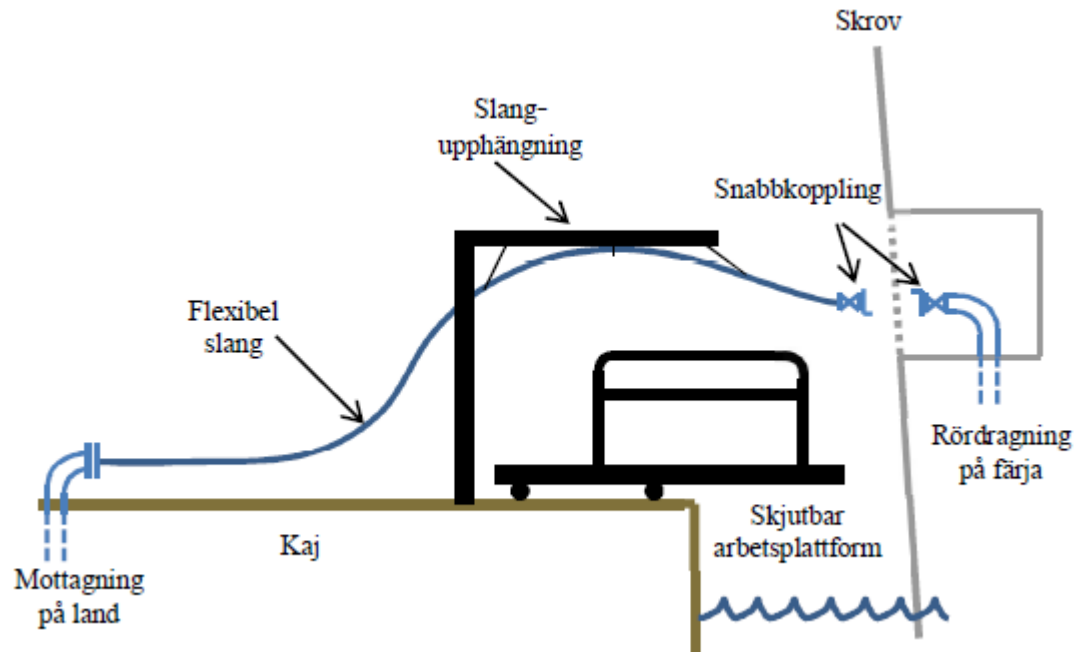
# Ariel view of the docking point to the ship



# The Gothenburg District Heating



# The principle for the connection of District Heating



Principle for connection to the ship with hoses in a flexible suspension and a new ramp. (in conjunction with wastewater)

The drip-free quick couplers..  
(aviation style)



# The Stena Danica Ferry

In regular service between Gothenburg and Fredrikshamn (Denmark)

Built 1983

Approx. 2300 passengers

Approx. 500 Cars

At quay ~ 6 hours/day (Gothenburg)





# The Gothenburg District Heating

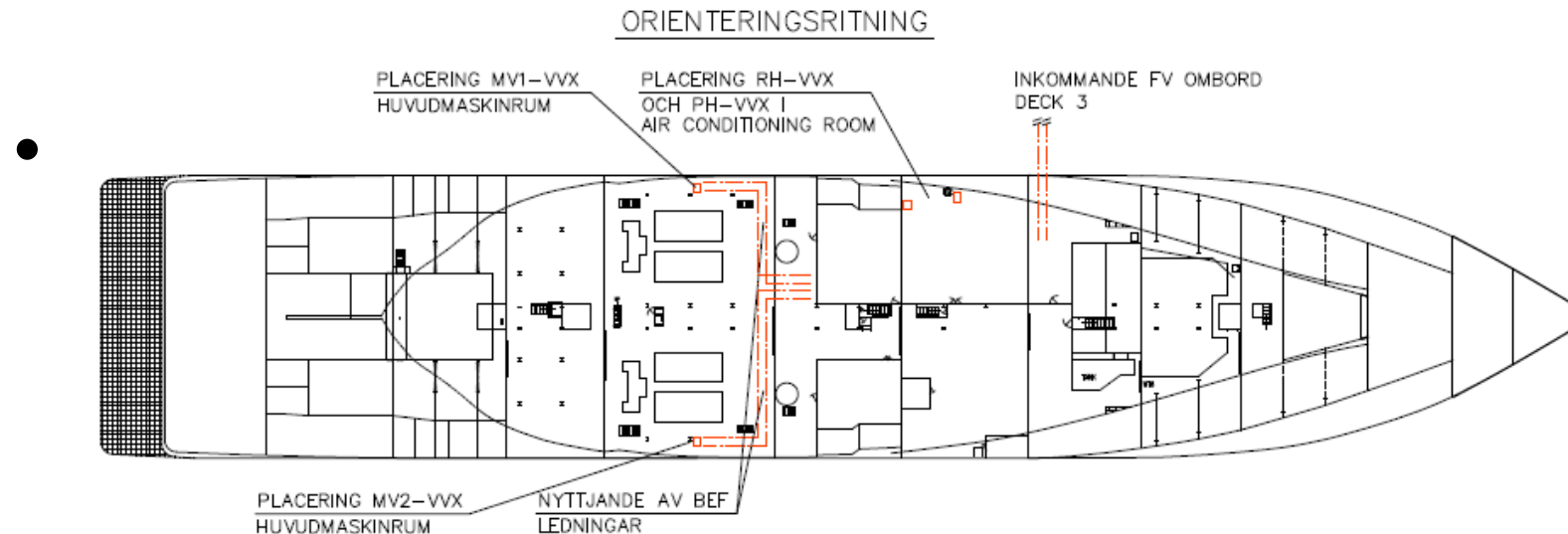


# The Gothenburg District Heating



## Installed Capacity

- Pretreatment:.....420 kW
- Reheating.....320 kW
- Engine heating.....2 x 220 kW

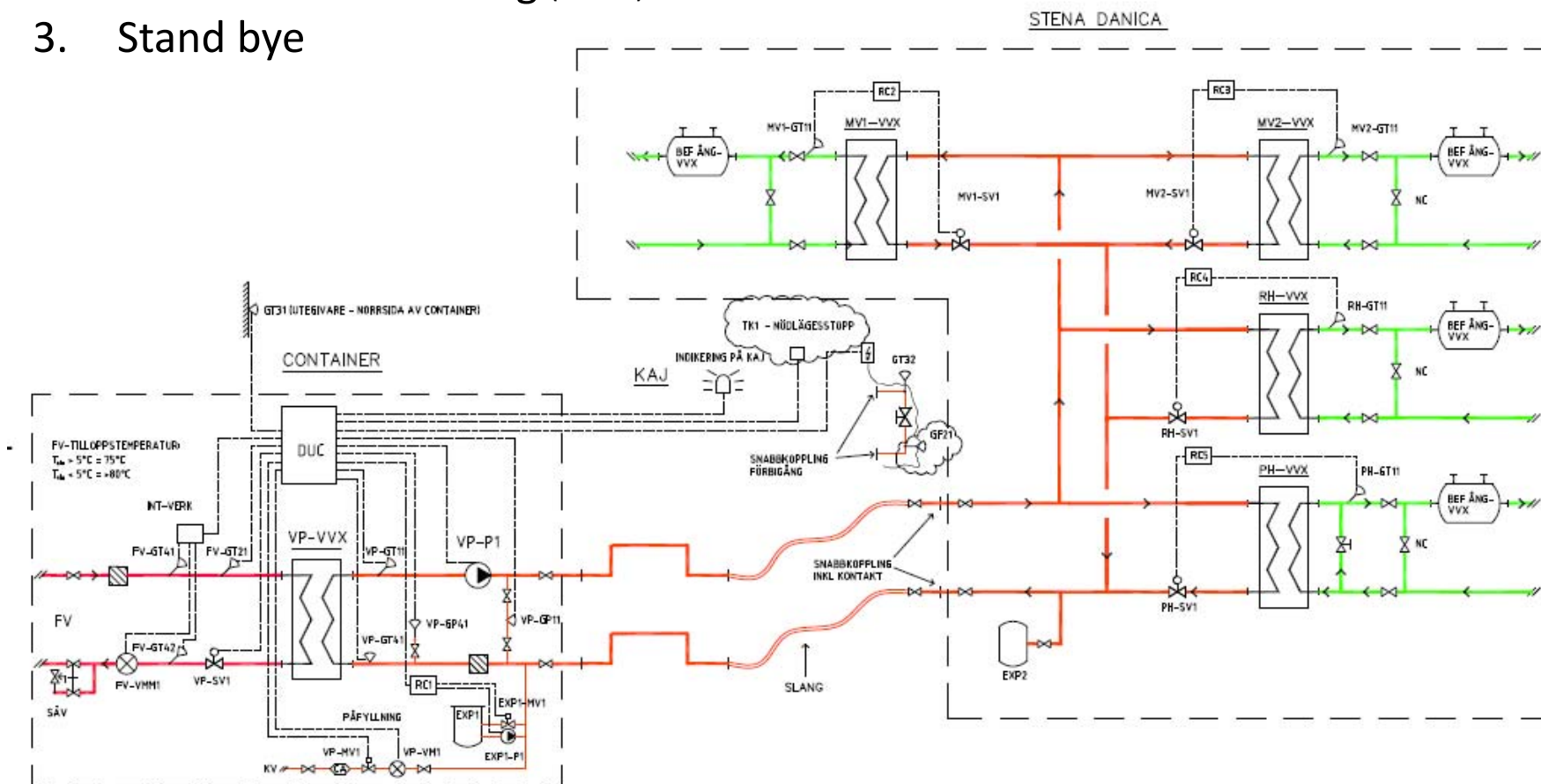




# The Technical Inclined (see me later)

Three different operating modes:

1. Heating ship.
2. Prevention of freezing (hoses)
3. Stand by





# The Gothenburg District Heating

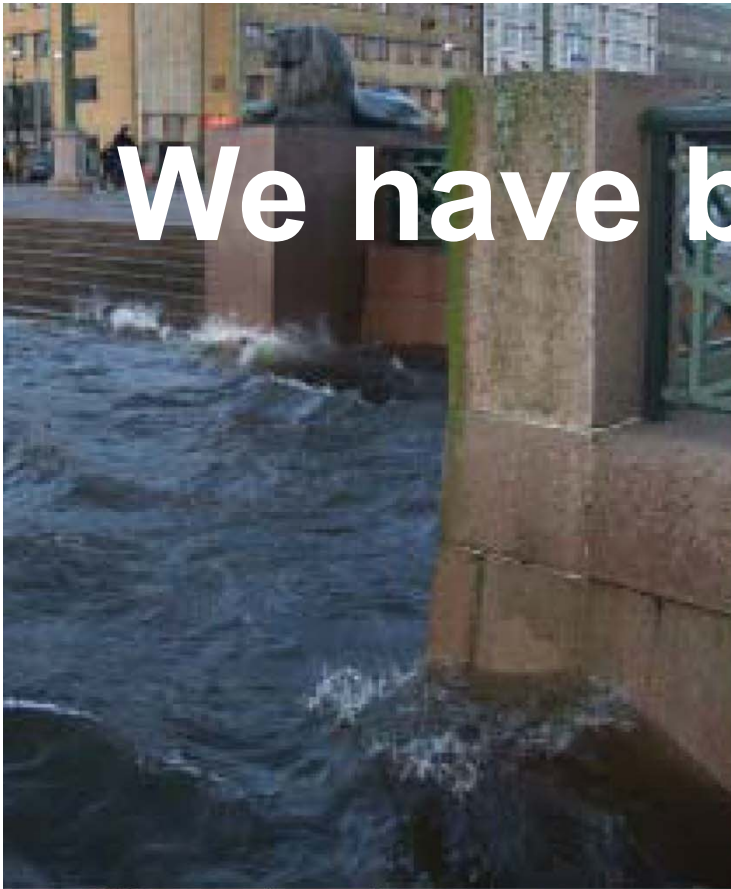
The business case:

3 Dimensions:

- Environmental
  - Reduced CO2 emission ~ 500 ton /yearly
  - No NOx. (isch < 100 kg/year)
  - No SOx. (isch < 10 kg/year)
- Social
  - Less noise (nearby neighbors 😊)
- Economical
  - District Heating less expensive then oil.
  - Pay back < 2 years.
  - [Oil burner  $\xrightarrow{\text{yields}}$  85% heat], 1 ton Oil= 11 MWh= 45 Euro/MWh.

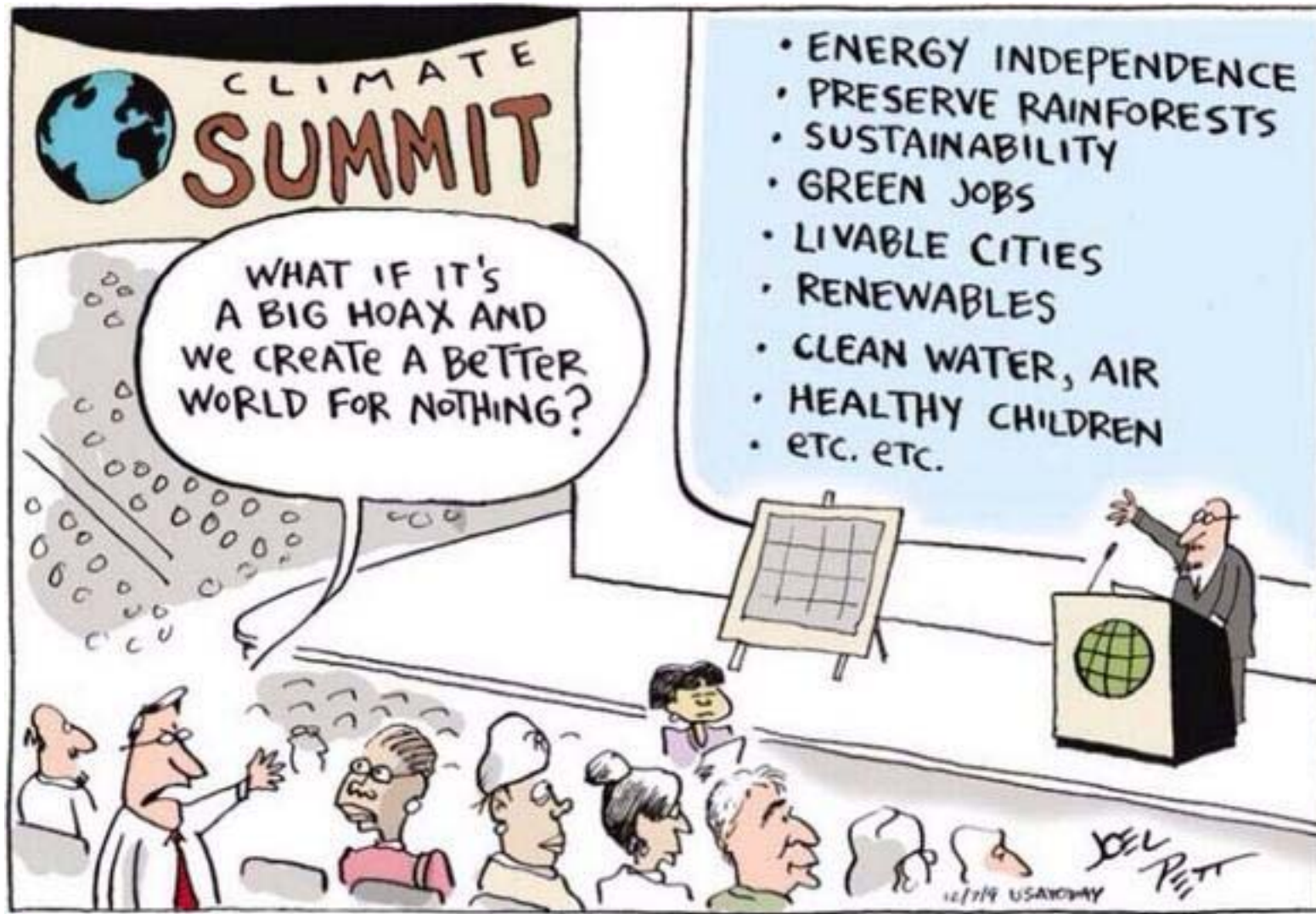


# We have been awaken!

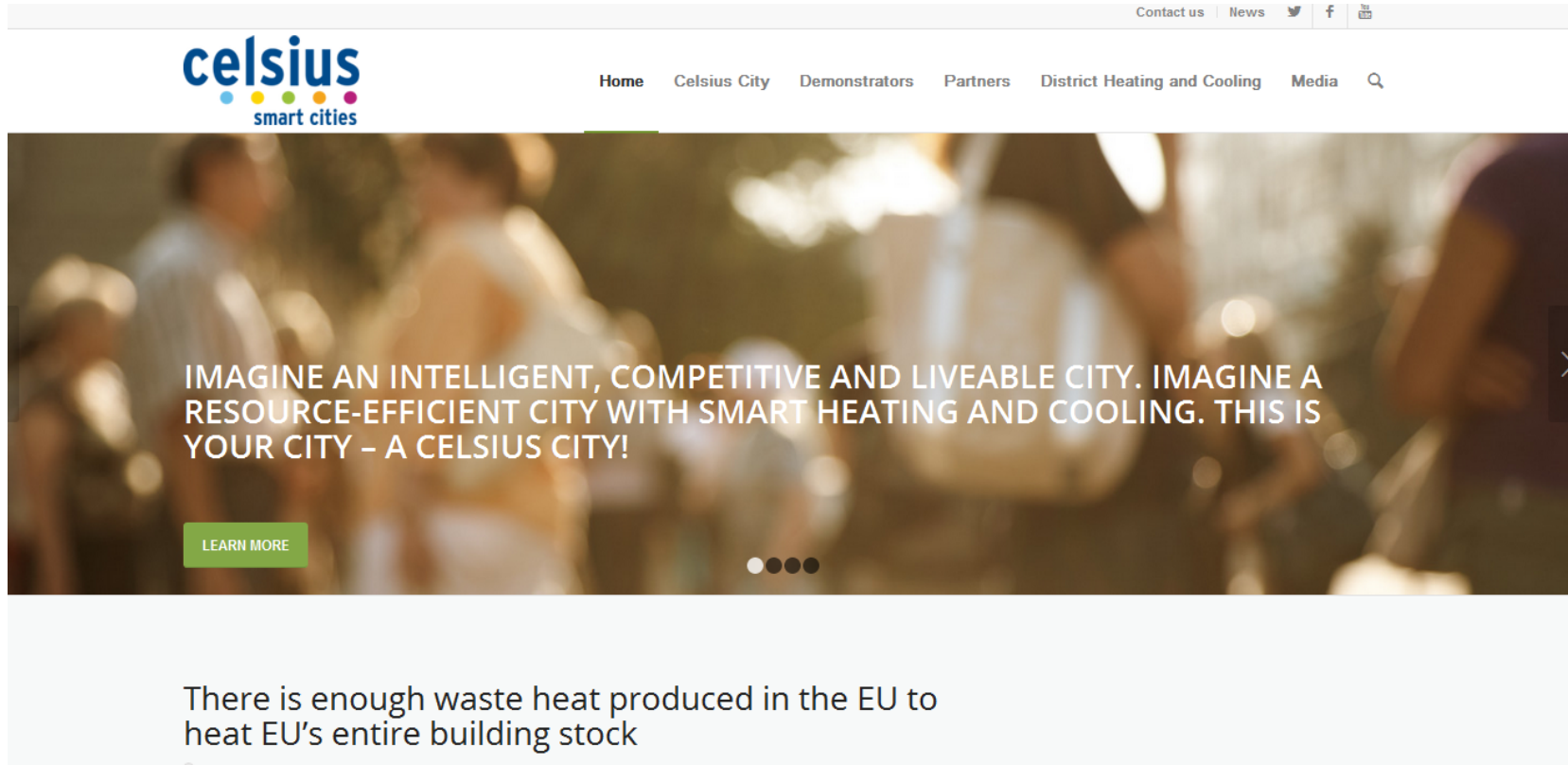


 **Göteborg Energi**





# Thank you for the attention !



The screenshot shows the Celsius Smart Cities website homepage. At the top right, there are links for 'Contact us', 'News', and social media icons for Twitter, Facebook, and YouTube. The Celsius logo, featuring the word 'celsius' in blue and 'smart cities' in smaller text with four colored dots (blue, yellow, green, purple) above it, is on the left. A navigation menu includes 'Home', 'Celsius City', 'Demonstrators', 'Partners', 'District Heating and Cooling', and 'Media'. The main content area features a blurred background image of people in a social setting. Overlaid on this image is the text: 'IMAGINE AN INTELLIGENT, COMPETITIVE AND LIVEABLE CITY. IMAGINE A RESOURCE-EFFICIENT CITY WITH SMART HEATING AND COOLING. THIS IS YOUR CITY – A CELSIUS CITY!'. Below this text is a green 'LEARN MORE' button and three small black dots. At the bottom of the screenshot, a light blue box contains the text: 'There is enough waste heat produced in the EU to heat EU's entire building stock'.

Visit us [www.celsiuscity.eu](http://www.celsiuscity.eu)!

