



*REWARDHeat*

# *DHC Investor Perspectives*

13:00-17:00, 16th June 2022

Helsingborg, Sweden

# REWARDHeat DHC Investor Perspectives

Afternoon Session: Thursday 16th 13:00 – 17:00



## Agenda & Speakers:

**Opening remarks & moderation:** Kristina Lygnerud - Senior Energy Department Manager, IVL

**Keynote speech:** Anders Ericsson – CEO, Värmevärdan/Adven

**Learnings from REWARDHeat project:** Tobias Popovic – Professor of Corporate & Sustainable Finance, HfT Stuttgart

### Panel Discussion:

- Allister Sykes – Director, Asper Investment Management
- Peter Dahl – Investment Manager, Polhem Infra
- Georg Inderst – Principal, Inderst Advisory

### Pitch Session by REWARDHeat demonstrator networks:

Helsingborg and Mölndal demo site:

- Håkan Knutson – Managing Director, Indepro

Szczecin demo site:

- Lilli Wolny – Project Manager, Szczecińska Energetyka Ciepła (SEC)

Feedback from financial experts

ADVEN

värmevärden

REWARDHeat, June 15th – 17th

Investor Perspectives



*Anders Ericsson*

*CEO, Adven/Värmevärden*

# The leading partner in Energy Transition

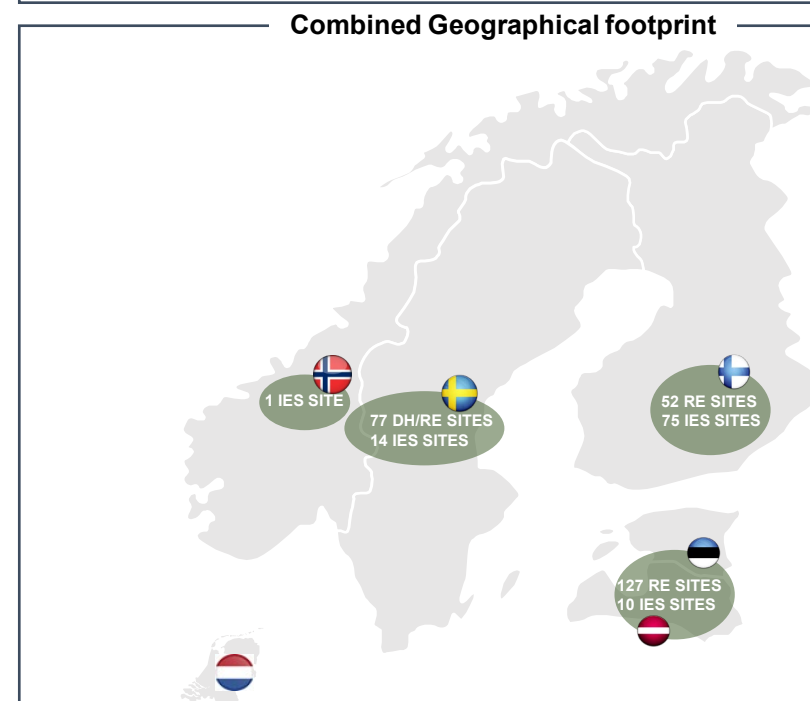
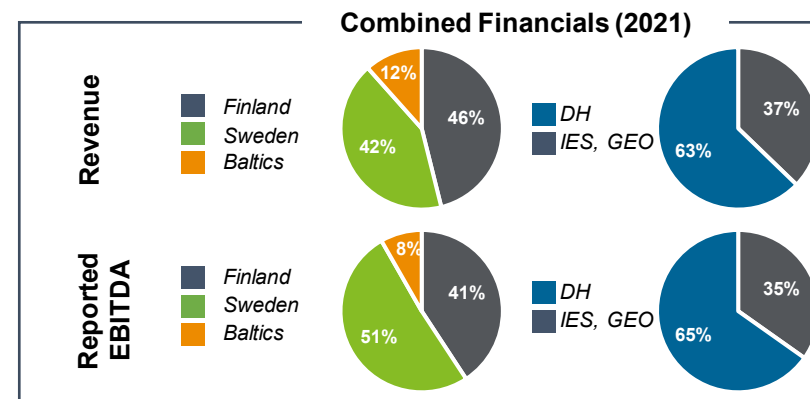
**CEO**                    **Anders Ericsson**

**Employees**            **Total: 560**  
 Finland 220  
 Sweden 220  
 Estonia & Latvia 120

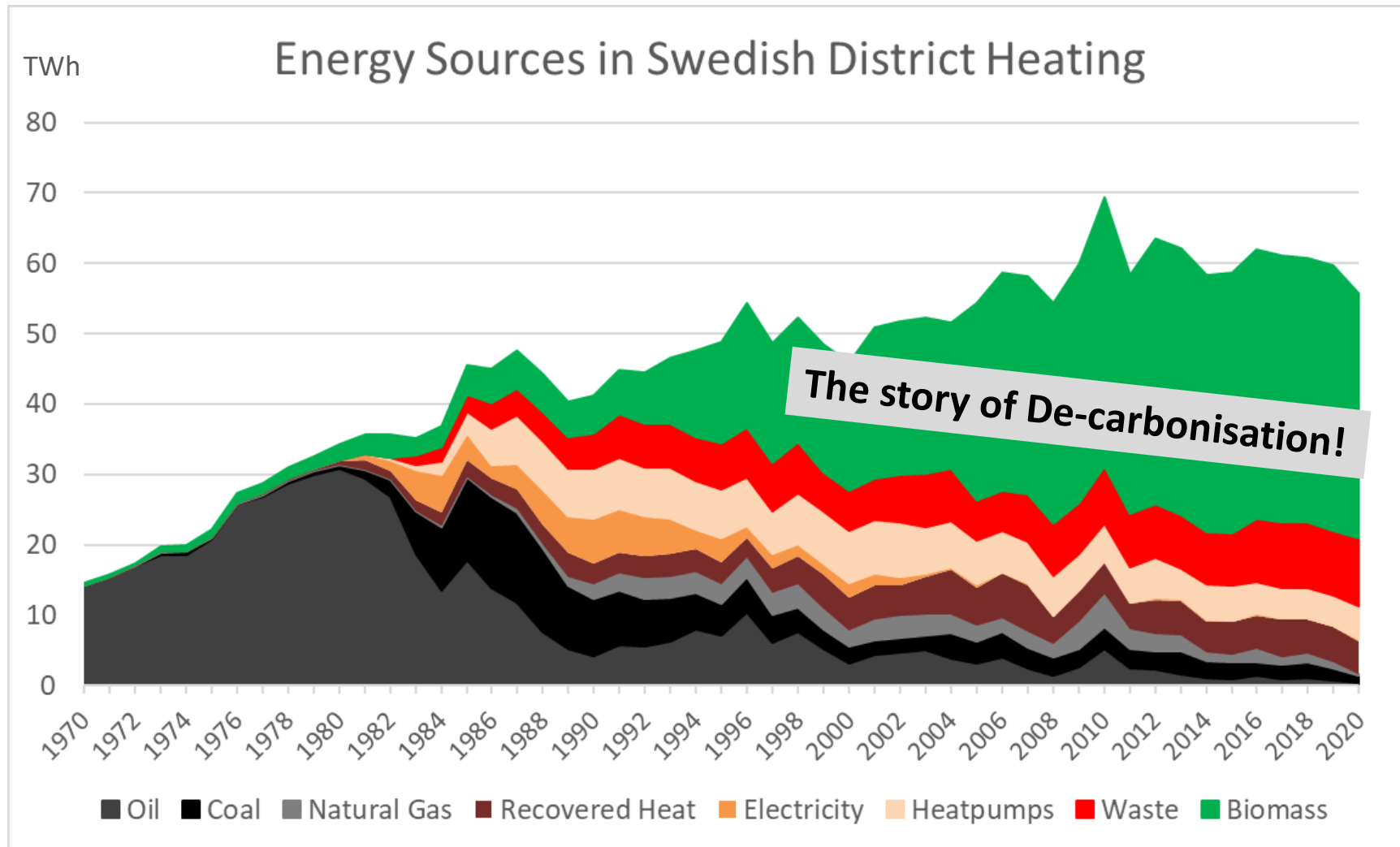
**Financials (2021)**            **Net Sales: € 280 M**  
**Asset: € 1.5 b**

**Energy volume**            **c. 5.1 TWh**  
 c. 350 sites

**Customer Offerings**            **District heating**  
 Decentralized Real Estate solutions  
**Industrial infrastructure:** process heating, cold and cooling, energy recovery, water treatment and energy intensive processing

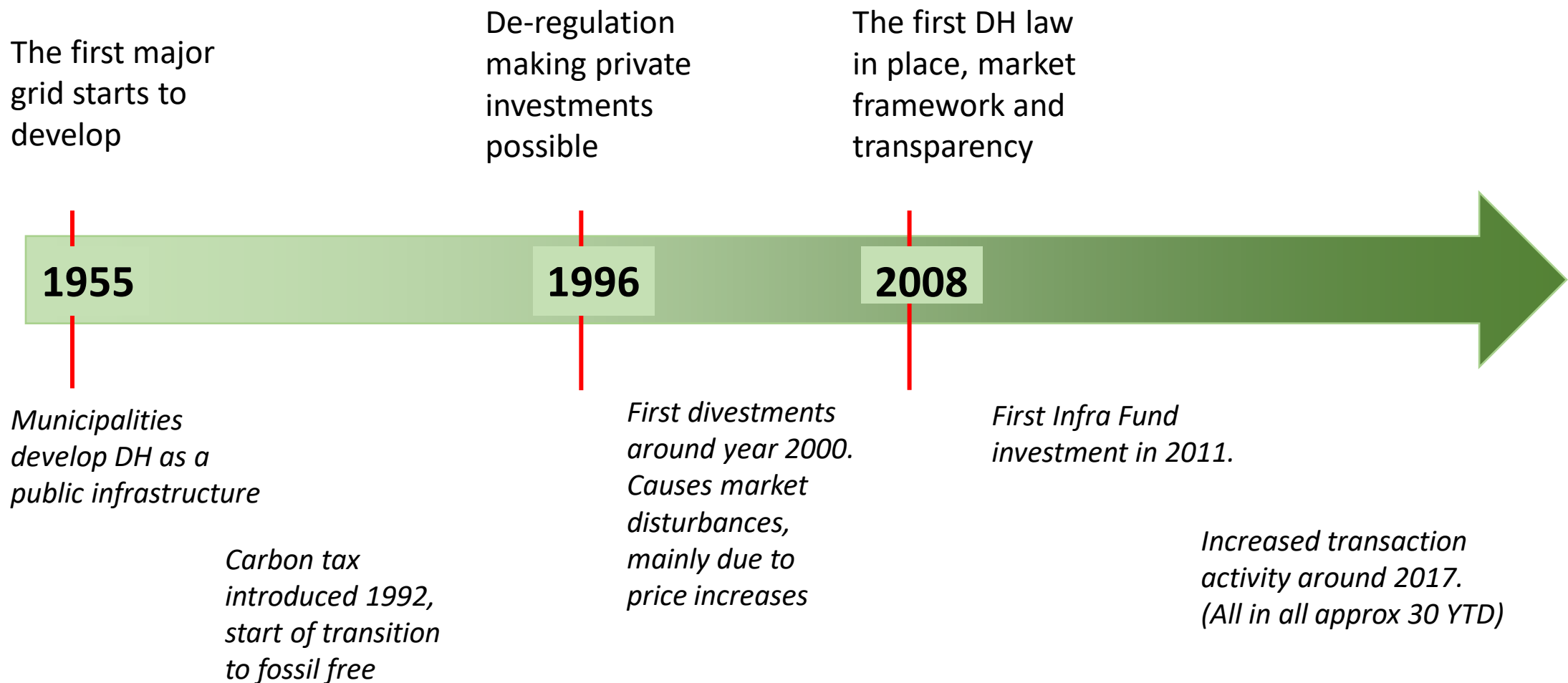


# The Story of De-Carbonisation



Source: Swedish Energy Agency

# The Story of De-Regulation and Divestment



# Opportunities to Invest in DH

- The Nordic experience has shown that DH has the potential to play a big role in the needed de-carbonization of the heating (and cooling) sector
- The Nordic experience has also proven that DH can provide predictable cashflows matching the requirements of many institutional investors
- *Customer focus* - A DH networks is a natural monopoly and require either regulation or high trust/transparency to build customer confidence
- *Green field projects* – To develop DH is a long term and multiplayer effort, yet to be proven to fit for institutional investors



*REWARDHeat*

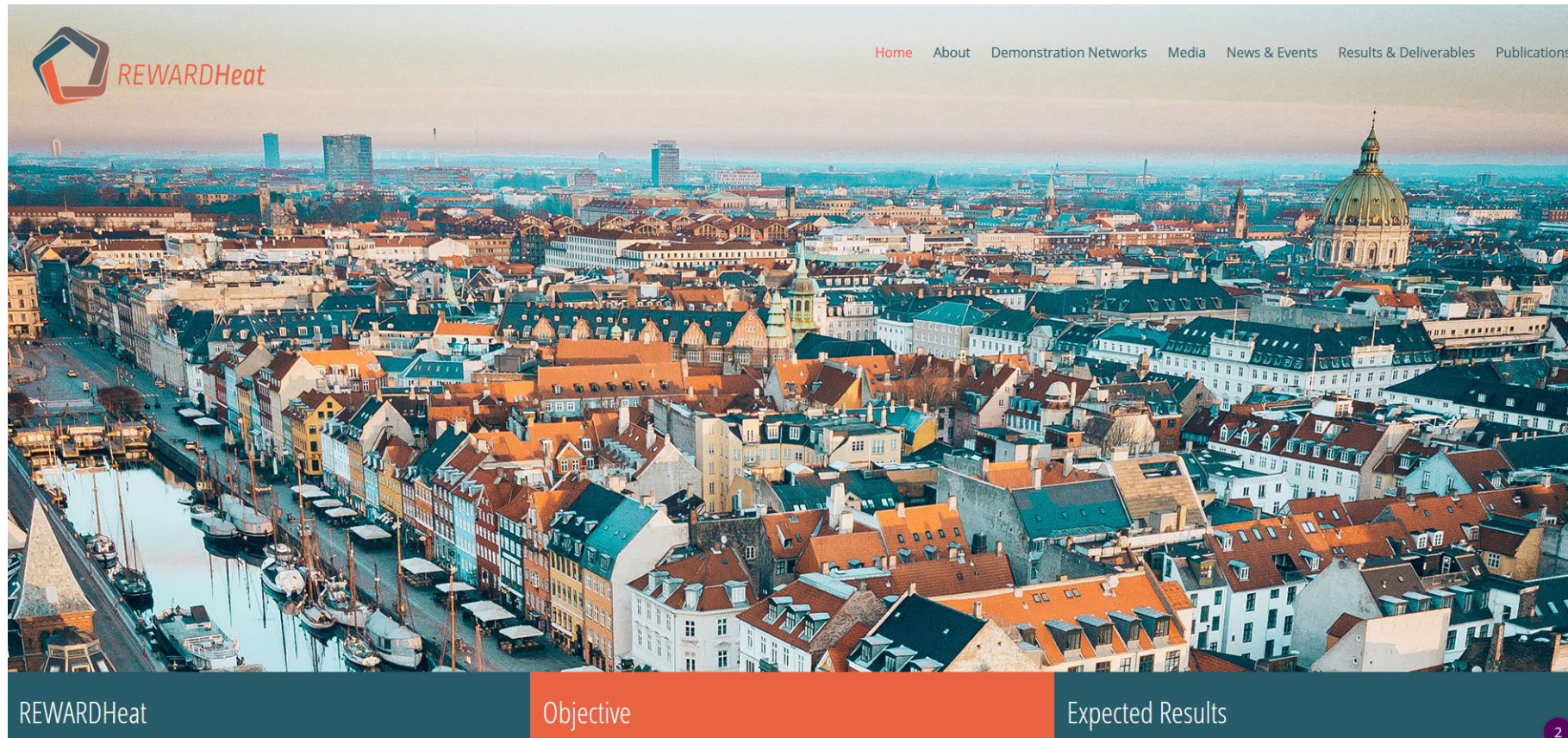
# Attracting Investors to DHCN – Learnings from the REWARDHeat project

Hochschule  
für Technik  
Stuttgart

Prof. Dr. Tobias Popovic, Sebastian Schultze,  
Stuttgart University of Applied Sciences, Center for Sustainable Economics and  
Management (CSEM), Sustainable Finance-Cluster



# REWARDHeat-Project



Source: <https://www.rewardheat.eu/en/>

24.06.2022

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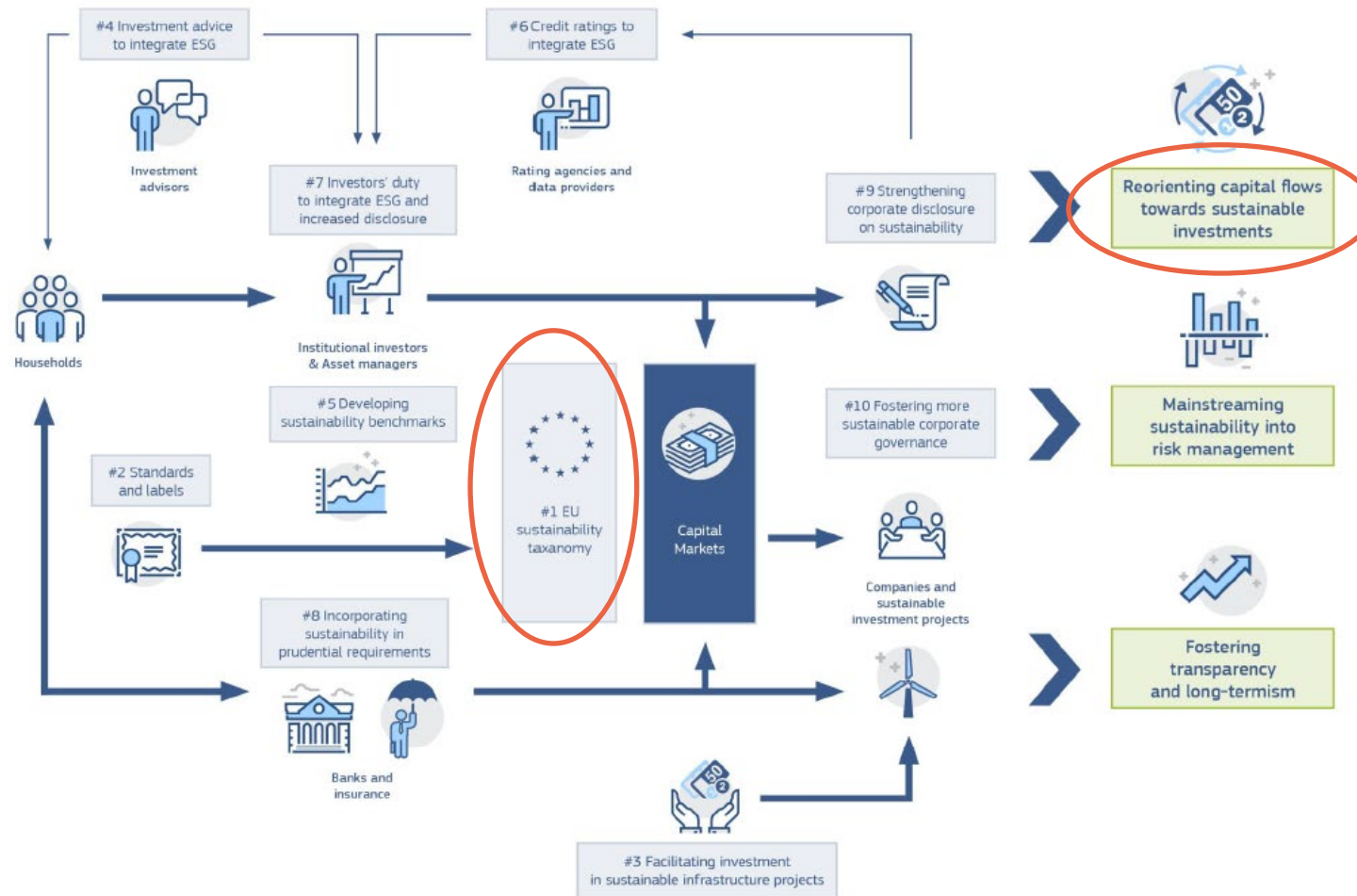
# *Sustainable Finance & Investments – THE next big thing?*



*"The next 1,000 unicorns won't be search engines or social media companies, they'll be sustainable, scalable innovators – **startups that help the world decarbonize and make the energy transition affordable for all consumers.**"*

Larry Fink, CEO, BlackRock (January 2022)

# EU Action Plan on Financing Sustainable Growth – Transforming the real economy



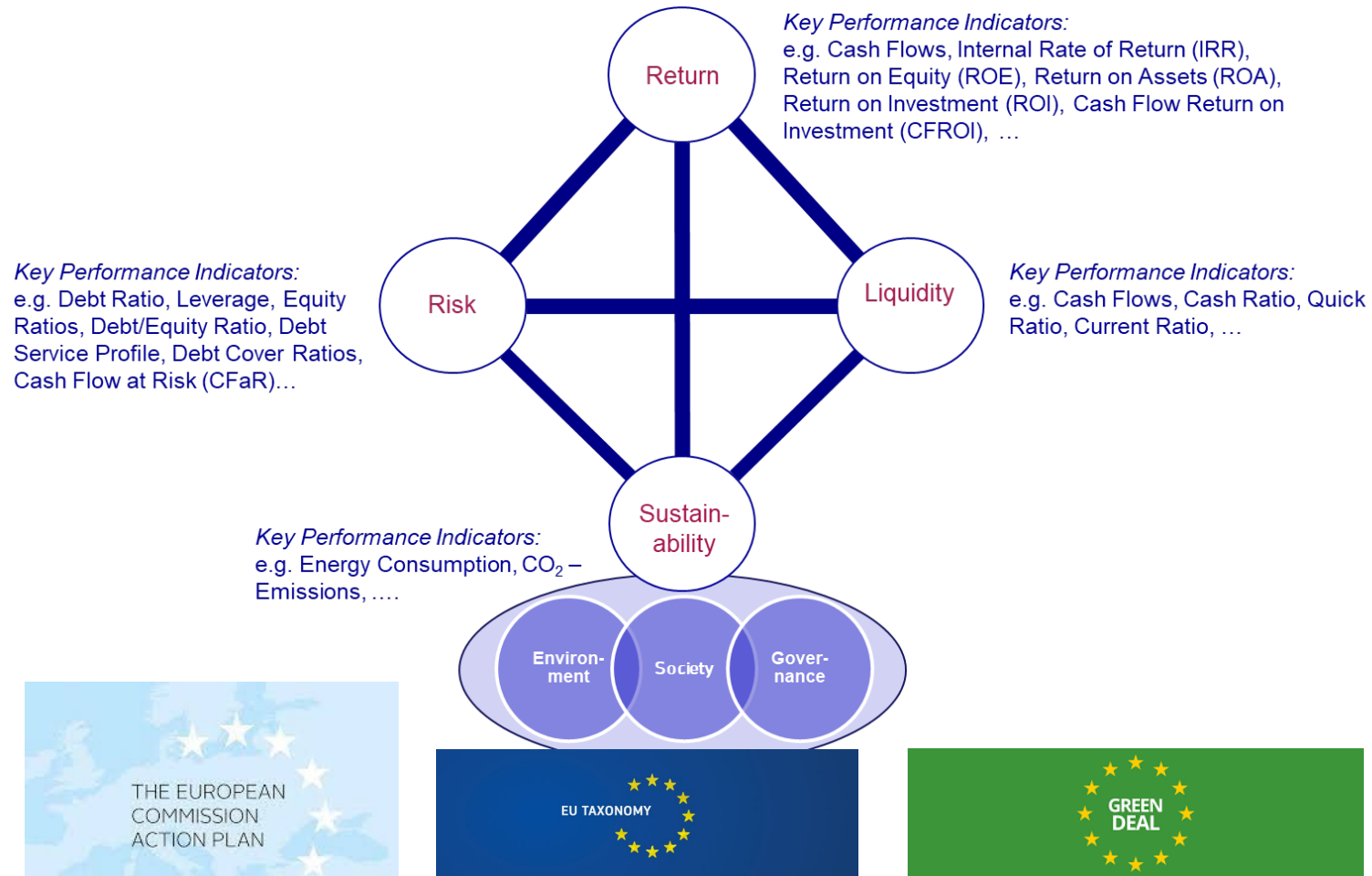
Source: European Commission (2018): <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0097&from=EN>

# *(Institutional) investor groups, identify their needs and objectives*



Banks	Investment Funds	Insurance Companies, Pension Funds	International Financial Institutions	Others
<ul style="list-style-type: none"><li>• Commercial Banks</li><li>• Investment Banks</li><li>• Savings Banks</li><li>• Cooperative Banks</li><li>• Public Promotional Banks</li><li>• ...</li></ul>	<ul style="list-style-type: none"><li>• Open-end Funds</li><li>• Closed-end Funds</li><li>• Infrastructure Funds</li><li>• Sovereign Wealth Funds</li><li>• ...</li></ul>	<ul style="list-style-type: none"><li>• Insurance Companies</li><li>• Re-Insurance Companies</li><li>• Pension Funds</li><li>• ...</li></ul>	<ul style="list-style-type: none"><li>• European Union</li><li>• EIB</li><li>• European Fund for Strategic Investments (EFSI)</li><li>• European Territorial Co-operation (ETC)</li><li>• Connecting European Facility (CEF)</li><li>• European Bank for Reconstruction and Development (EBRD)</li><li>• IRENA</li><li>• World Bank</li><li>• ...</li></ul>	<ul style="list-style-type: none"><li>• Utilities</li><li>• Industrials</li><li>• ...</li></ul>

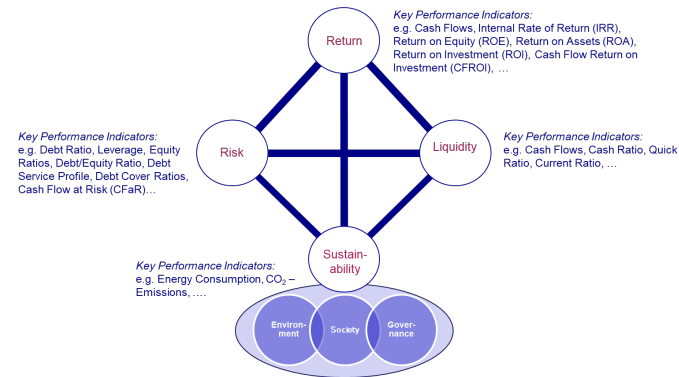
# Conceptual framework for investment and financing decisions in the area of Sustainable Finance



Source: own representation based on Popovic, T. (2012); Images: UN, UN PRI, European Commission, Volkswagen AG, CECE

# Sustainability Balanced Scorecard (SBSC)

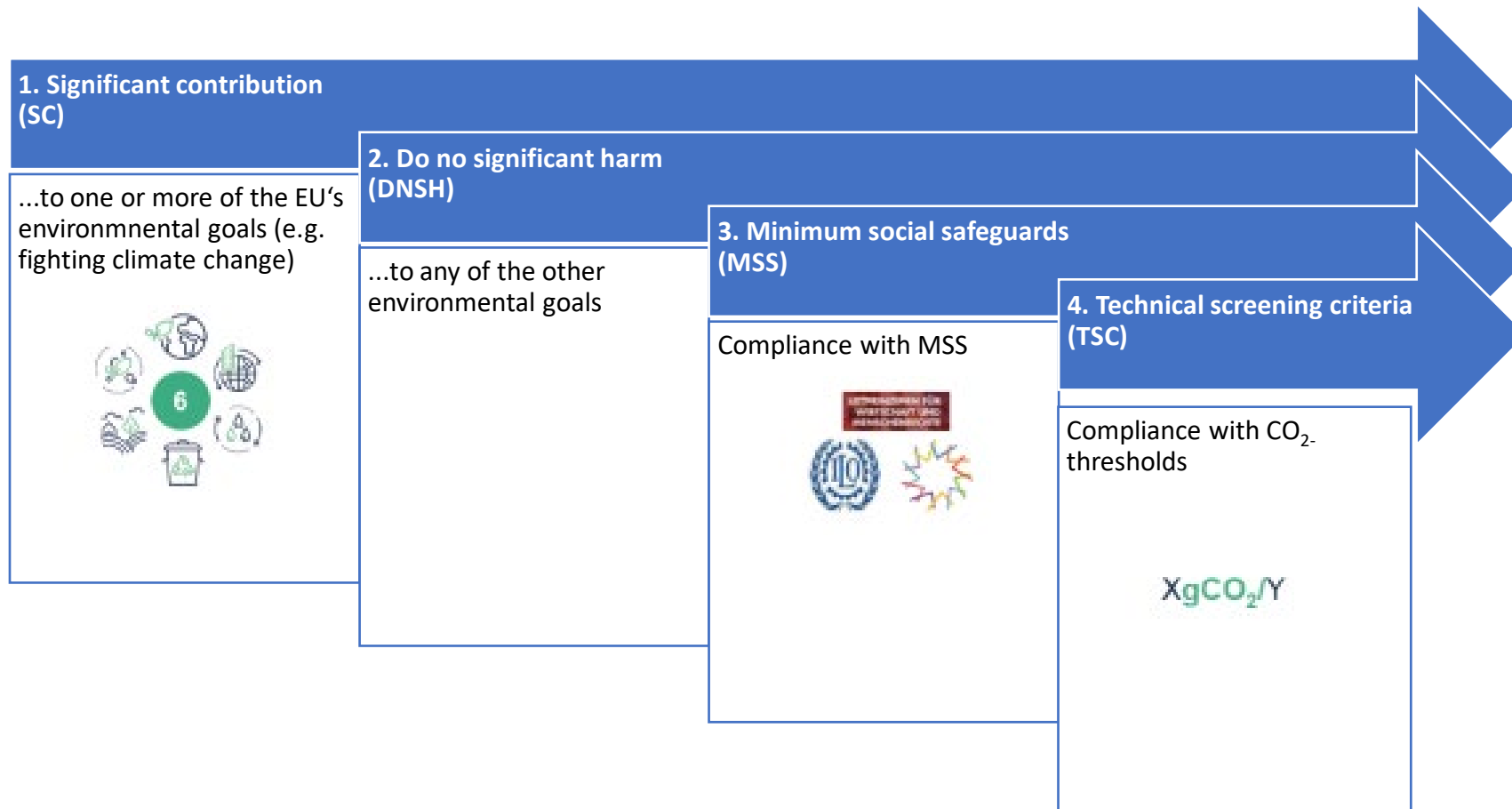
## KPIs for investors



Return	Risk	Liquidity	Sustainability (ESG)
LCoH = Levelized Cost of Heat	Debt Ratio	Cash Flow	GHG Emissions
NPV = Net present value	Equity Ratio	Cash Ratio	Specific primary energy
CAPEX = Capital expenditure Costs	Leverage	Quick Ratio	% of DH production based on RE and waste heat
OPEX = Operational expenditure Costs	Carbon abatement costs	Current Ratio	GHG emissions abatement potential
...	...	...	... ( S&G)

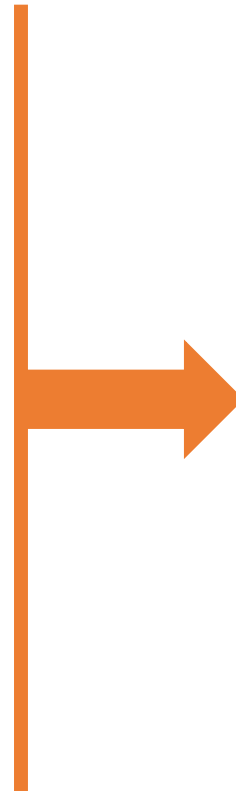
Source: Own illustration

# Decision-making process for Taxonomy-aligned investments/financing



Source: Own illustration based on LBBW (2021), EU (2021, [https://ec.europa.eu/info/sites/default/files/business\\_economy\\_euro/events/documents/finance-events-200312-presentation-taxonomy-usability\\_en.pdf](https://ec.europa.eu/info/sites/default/files/business_economy_euro/events/documents/finance-events-200312-presentation-taxonomy-usability_en.pdf))

# Regulatory trends increase attractiveness for DHCN as a sustainable asset class

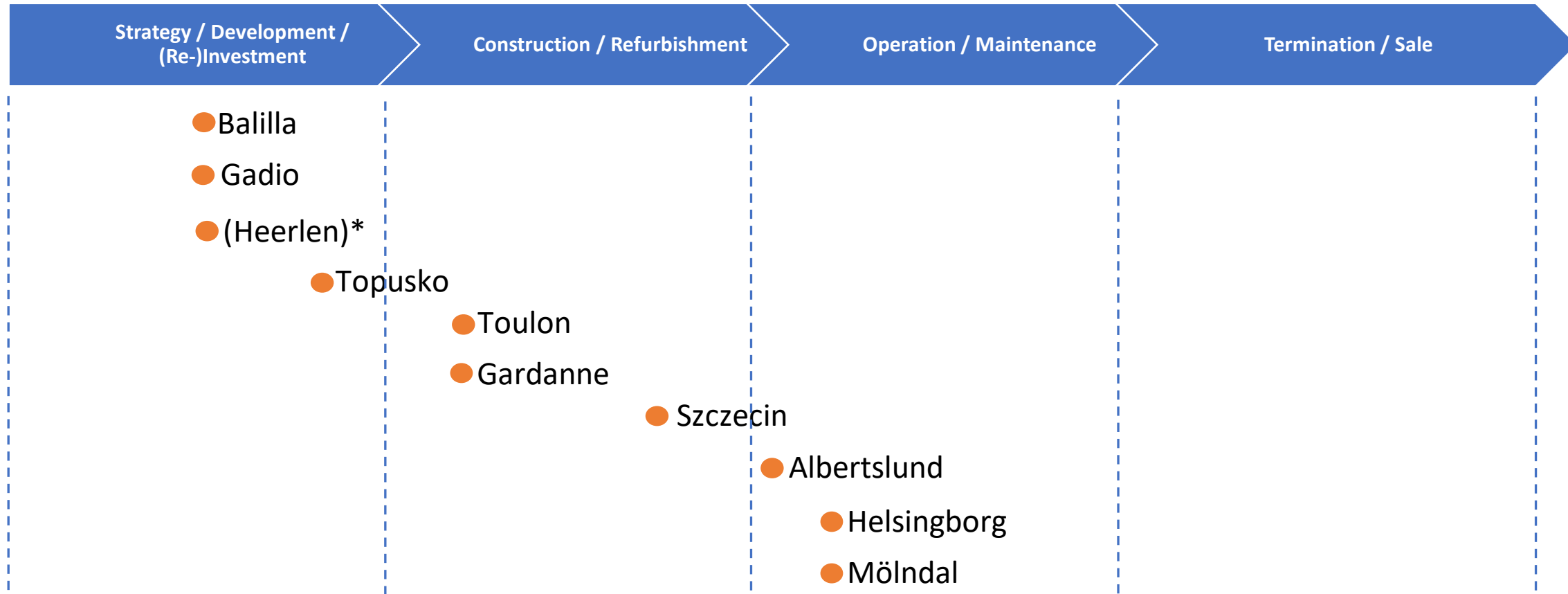


Checklist DH-Asset Class	
Reorientation of capital flows	✓
Compliance with the CO <sub>2</sub> limits of the taxonomy	✓
Contribution to UN SDGs	✓

Sources: own illustration. Images: UN, UN PRI, European Commission, Volkswagen AG, CECE



# Mapping REWARDHeat demosites to the infrastructure finance lifecycle (tentative)



Source: Popovic (2022) based on demosites' information and results of REWARDHeat WP 3.3.; \* delayed indefinitely

# DHCN in the context of the infrastructure finance lifecycle – risks and risk transfer



	Strategy / Development / (Re-)Investment	Construction / Refurbishment	Operation / Maintenance	Termination / Sale
Risks (focus on cash flows)	<ul style="list-style-type: none"> <li>• High investment volume</li> <li>• Lack of sufficient funding</li> <li>• Inflation/interest rates</li> <li>• Long time horizon</li> <li>• Project complexity/feasibility</li> <li>• Technological</li> <li>• Regulatory</li> <li>• Environmental</li> <li>• Etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Governance</li> <li>• Permits/contracts</li> <li>• Construction delays</li> <li>• Inflation/interest rates</li> <li>• High cash outflows due to CAPEX</li> </ul>	<ul style="list-style-type: none"> <li>• Governance</li> <li>• Qualitative deficit of infrastructure /services</li> <li>• Stakeholder (esp. customer) acceptance</li> <li>• Demand volatility</li> <li>• Inflation/interest rates</li> <li>• Refinancing/liquidity</li> <li>• Counterparty default</li> </ul>	<ul style="list-style-type: none"> <li>• Contract duration</li> <li>• Decommissioning risk</li> <li>• Asset transfer</li> </ul>
Risk transfer & mitigation	<ul style="list-style-type: none"> <li>• (State) guarantees</li> <li>• Insurance</li> <li>• Derivatives</li> </ul>	<ul style="list-style-type: none"> <li>• (State) guarantees</li> <li>• Insurance</li> <li>• Derivatives</li> </ul>	<ul style="list-style-type: none"> <li>• (State) guarantees</li> <li>• Insurance</li> <li>• Derivatives</li> </ul>	<ul style="list-style-type: none"> <li>• (State) guarantees</li> <li>• Insurance</li> <li>• Derivatives</li> </ul>

Source: Popovic (2022) based on White & Case (2019, <https://www.whitecase.com/publications/insight/virtuous-cycle-creativity-and-innovation-infrastructure-finance>), Ehlers, Thorsten (2014): Understanding the challenges for infrastructure finance, BIS Working Papers, No 454, BIS, Monetary and Economic Department, Basel 2014, August 2014, p. 5 ; OECD (2015): Infrastructure Financing Instruments and Incentives. OECD. Paris. Available online at <http://www.oecd.org/finance/private-pensions/Infrastructure-Financing-Instruments-and-Incentives.pdf>,

# DHCN in the context of the infrastructure finance lifecycle – investors and financing instruments



	Strategy / Development / (Re-)Investment	Construction / Refurbishment	Operation / Maintenance	Termination / Sale
Investors	<ul style="list-style-type: none"> <li>• <b>Equity sponsors</b>, e.g.                             <ul style="list-style-type: none"> <li>- Utilities</li> <li>- Governments/ municipalities/ multilateral institutions</li> <li>- Infrastructure funds</li> <li>- Private equity</li> <li>- Pension funds?</li> </ul> </li> <li>• <b>Debt investors:</b> <ul style="list-style-type: none"> <li>- Promotional banks</li> <li>- Multilateral institutions (e.g. EIB)</li> <li>- Bank syndicates</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Equity sponsors</b>, e.g.                             <ul style="list-style-type: none"> <li>- Utilities</li> <li>- Governments/ municipalities/ multilateral institutions</li> <li>- Infrastructure funds</li> <li>- Private equity</li> <li>- Pension funds?</li> </ul> </li> <li>• <b>Debt investors:</b> <ul style="list-style-type: none"> <li>- Promotional banks</li> <li>- Multilateral institutions (e.g. EIB)</li> <li>- Bank syndicates</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Investment funds</li> <li>• Infrastructure funds</li> <li>• Pension funds</li> <li>• Sovereign Wealth funds</li> <li>• (Re-)Insurance Companies</li> </ul>	<ul style="list-style-type: none"> <li>• Investment funds</li> <li>• Infrastructure funds</li> <li>• Pension funds</li> <li>• Sovereign Wealth funds</li> <li>• (Re-)Insurance Companies</li> </ul>
Financing Instruments	<ul style="list-style-type: none"> <li>• Subsidies</li> <li>• Blended finance/PPP</li> <li>• (Private) Equity</li> <li>• Debt:                             <ul style="list-style-type: none"> <li>- Promotional loans</li> <li>- (Syndicated) (Green) Loans</li> <li>- (Green) Bonds?</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Subsidies</li> <li>• Blended finance/PPP</li> <li>• (Private) Equity</li> <li>• Mezzanine</li> <li>• Debt:                             <ul style="list-style-type: none"> <li>- Promotional loans</li> <li>- (Syndicated) (Green) Loans</li> <li>- (Green) Bonds?</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• (Green) Bonds</li> <li>• (Green) Loans</li> </ul>	<ul style="list-style-type: none"> <li>• Leveraged finance</li> <li>• M&amp;A-transaction</li> <li>• Trade sale</li> <li>• Initial public offering (IPO)</li> </ul>

Source: Popovic (2022) based on White & Case (2019, <https://www.whitecase.com/publications/insight/virtuous-cycle-creativity-and-innovation-infrastructure-finance>), Ehlers, Thorsten (2014): Understanding the challenges for infrastructure finance, BIS Working Papers, No 454, BIS, Monetary and Economic Department, Basel 2014, August 2014, p. 5 ; OECD (2015): Infrastructure Financing Instruments and Incentives. OECD. Paris. Available online at <http://www.oecd.org/finance/private-pensions/Infrastructure-Financing-Instruments-and-Incentives.pdf>,

# *Due to inherent risks increasing importance of Blended Finance*



## Definition:

„Blended finance is the strategic use of development finance for the mobilisation of additional finance towards sustainable development in developing countries.”

## The OECD DAC Blended Finance Principles:

**Principle 1:** Anchor Blended Finance Use To A Development Rationale

**Principle 2:** Design Blended Finance To Increase The Mobilisation Of Commercial Finance

**Principle 3:** Tailor Blended Finance To Local Context

**Principle 4:** Focus On Effective Partnering For Blended Finance

**Principle 5:** Monitor Blended Finance For Transparency And Results

Source: Based on OECD (2021): The OECD DAC Blended Finance Guidance, p.3.: <https://www.oecd-ilibrary.org/docserver/ded656b4-en.pdf?expires=1655298823&id=id&accname=guest&checksum=6C7E03C083354BFD9F9B92329DEDDCF9>

# Financing instruments – EU Taxonomy- and SDG-aligned instruments



	Green Bonds	Green Loans	Green Bonded Loans (GSSD)	ESG-linked Bonds	ESG-linked Loans	ESG-linked Bonded Loans
<b>Definition</b>	• Environmentally oriented bonds	• Environmentally oriented loans	• Environmentally oriented SSD	• ESG-oriented bonds	• ESG-oriented loans	• ESG-oriented SSD
<b>Market relevance</b>	• high	• high	• increasingly	• increasingly	• increasingly	• increasingly
<b>(Binding) regulations</b>	• Green Bond Principles (ICMA*) • EU Green Bond Principles • EU Action Plan / EU Taxonomy	• Green Loan Principles (LMA*) • EU Action Plan / EU Taxonomy	• No, but usually orientation towards Green Bond Principles • EU Action Plan / EU Taxonomy	• Sustainability-Linked Bond Principles (ICMA) • EU Action Plan / EU Taxonomy	• Sustainability Linked Loan Principles (SLLP) (LMA*) • EU Action Plan / EU Taxonomy	• (Orientation Sustainability Linked Loan Principles (SLLP)) (LMA*) • EU Action Plan / EU Taxonomy
<b>Second Party Opinion (SPO)</b>	• Yes, e.g. by rating agency	• Yes, e.g. by rating agency	• (Yes, e.g. by rating agency)	• Yes, e.g. by rating agency	• Yes, e.g. by rating agency	• (Yes, e.g. by rating agency)
<b>ESG rating</b>	• meaningful	• meaningful	• meaningful	• meaningful	• meaningful	• meaningful
<b>ESG KPIs/SPTs**</b>	• meaningful	• meaningful	• meaningful	• necessary	• necessary	• necessary
<b>Use of Proceeds-Reporting</b>	• yes	• yes	• (yes)	• (yes)	• (yes)	• increasingly
<b>Examples (each exemplary)</b>	• BayWa • EnBW • KfW • EBRD • EIB • State of BaWü • E.ON • BASF • Numerous other companies	• Philips • Danone • Handle • Indorama Ventures	• Nordex ( • Man + Bumblebee • Porsche • Schaeffler • Nassauische Heimstätte (Green & Social) • energcity AG	• Enel • Association • Hapag-Lloyd • Handle • Pfeiderer GmbH	• Continental • Handle • Lanxess • German Stock Exchange • Dürr • Voith • Telefónica Germany	• Jenoptik AG, • RHI Magnesita • Faber-Castell AG • Faurecia SE

\*ICMA = International Capital Markets Association, LMA = Loan Market Association \*\* Key Performance Indicators, SPT = Sustainability Performance Targets

Source: Popovic, T. (2022): Wärmewende in Gebäuden und Infrastruktur – Sustainable Real Estate Finance und Sustainable Infrastructure Finance als Hebel?, in: Rogall, H. et al. (Hrsg.) (2022): 8. Jahrbuch Nachhaltige Ökonomie (2022/23) (submitted/in print).

## *Findings of investment experts interviews (1)*



### Development Bank:

“Investments have to be in alignment with Paris Agreement”

### Sustainable Finance Rating Agency:

“A main driver of green infrastructure investments is regulation”

“Our clients desperately look for genuine, sustainable investments.”

### United Nations Environment Programme Finance Initiative (UNEP FI):

“Investments have to contribute to the SDGs”

“What is important to be able to apply the taxonomy? **Data, data data!**  
Data availability and data quality. Data is the biggest issue.”

## *Findings of investment experts interviews (2)*



### Infrastructure Finance Advisory:

“DH can represent a diversification of the portfolio, as it is not linked to the normal stock market cycle”

“Projects must have a volume of several 100 million Euro to be of interest to large investors.”

### Regional promotional/development bank:

“DHCN-projects must be bundled as an investment in order to become interesting for more investors.”

“If you have an investment of 300, 400 or 500 million Euro and a sustainability certificate on your investment, it is much easier to convince big investors.”

# Outlook – Investor-financial-instruments-matrix



	Equity	Mezzanine	Debt	Structured and Cashflow Based Finance	Grants / Subsidies / Subsidized Funding	Others
Private / Retail Investors						
Public Institutions						
Banks						
Investment Funds						
Pension Funds						
Insurance Companies						
International / Multilateral Financial Institutions						
Industrial Investors (e.g. Utilities)						

Source: Popovic (2020)



# *Conclusion and outlook*



- EU regulatory initiatives (e.g. Taxonomy) provide tailwind for sustainable infrastructures
- This should result in more investor's interest for DHCN. If so, which kinds of investors?
- Innovative sustainable finance instruments (e.g. ESG-linked) should gain importance. Which ones will be of special importance?
- Data for calculating KPIs relevant for investors' decision making will increase in relevance. What are investors' expectations in this respect?



*REWARDHeat*

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*Thank you*  
[www.rewardheat.eu](http://www.rewardheat.eu)



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The document reflects the author's view. The European Commission has no liability for any use that may be made of the information it contains.

# *Panel Discussion*



- Allister Sykes – Director, Asper Investment Management
- Peter Dahl – Investment Manager, Polhem Infra
- Georg Inderst – Principal, Inderst Advisory

# REWARDHeat Decarbonise Heat

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**Allister Sykes**

Asper Investment

Management

June 2022

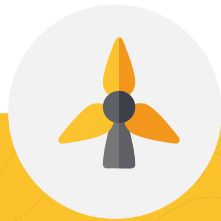


# Our mission: Build the New!

Asper is an independent, specialist investment management firm **100% focused on sustainable infrastructure**

**We have invested €1.7bn** to date in new build sustainable infrastructure

Our passion is to support entrepreneurial developers and **help them build** their projects and businesses faster



**>1.2GW**

*Built across Europe*



**€1.7bn**

*Total capital invested in newly built infrastructure*



**2014**

*First district heating investment made*



**100%**

*Focus on sustainable real assets*

# Our District Heating experience



## Swedish District Heating



- Aggregated a new platform in Sweden in 2014 backing an experienced management team including material plant upgrades



## Dutch District Heating

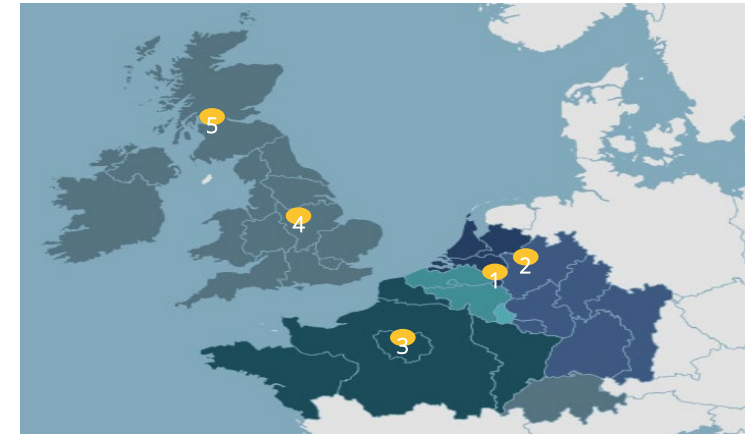


- Latest DH platform backed by Asper in 2020. Building a portfolio of DH network from diverse sustainable heat sources



## 5GDHC project

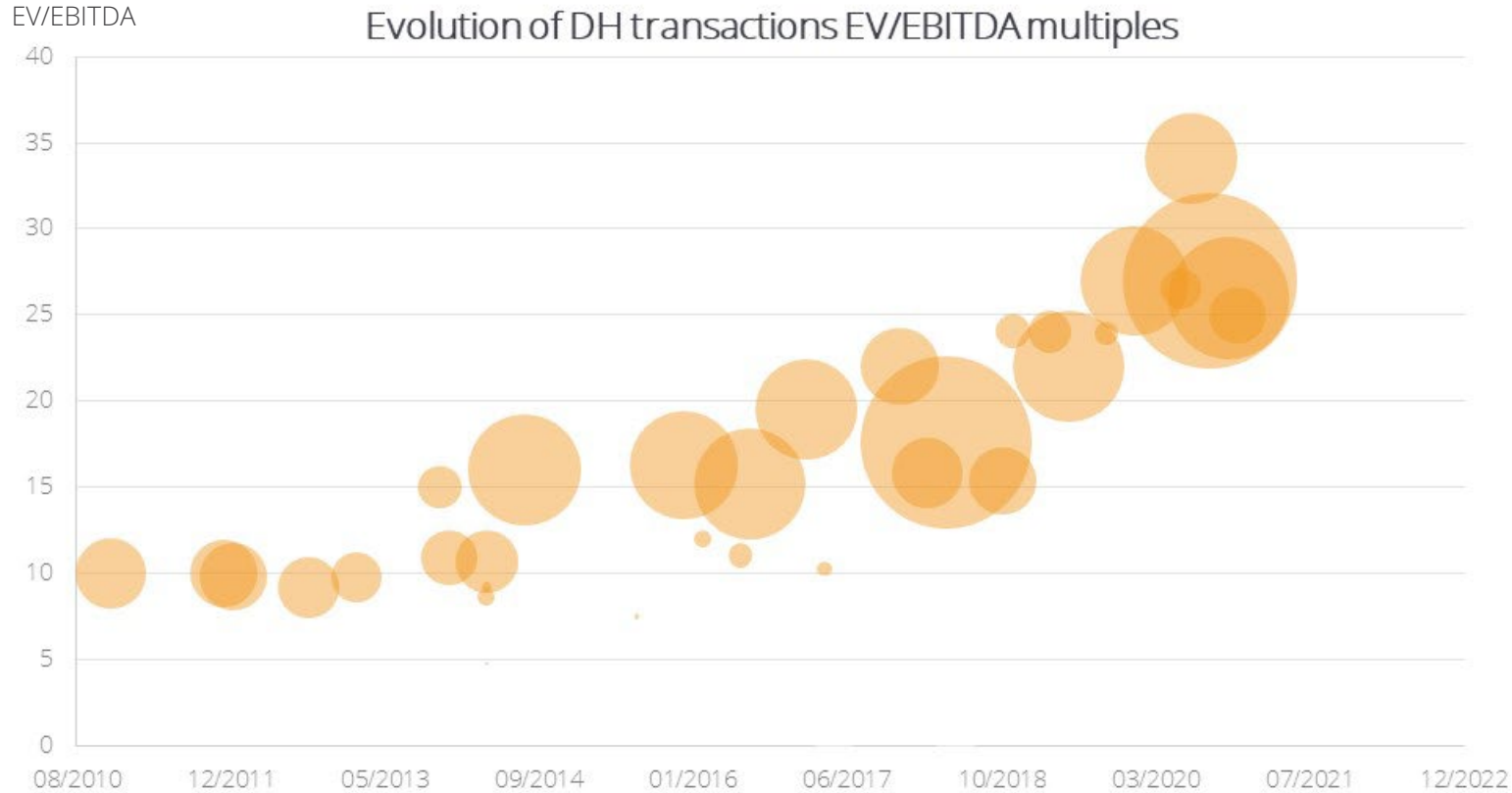
5 pilot projects within the Interreg NWE area



- Asper as financial partner of D2Grids since 2018 aiming to develop 5<sup>th</sup> generation heating and cooling networks (5GDHC) across Europe

+ more exciting news later this year...

# Brownfield DH networks are infrastructure assets...



Size of bubble = transaction size

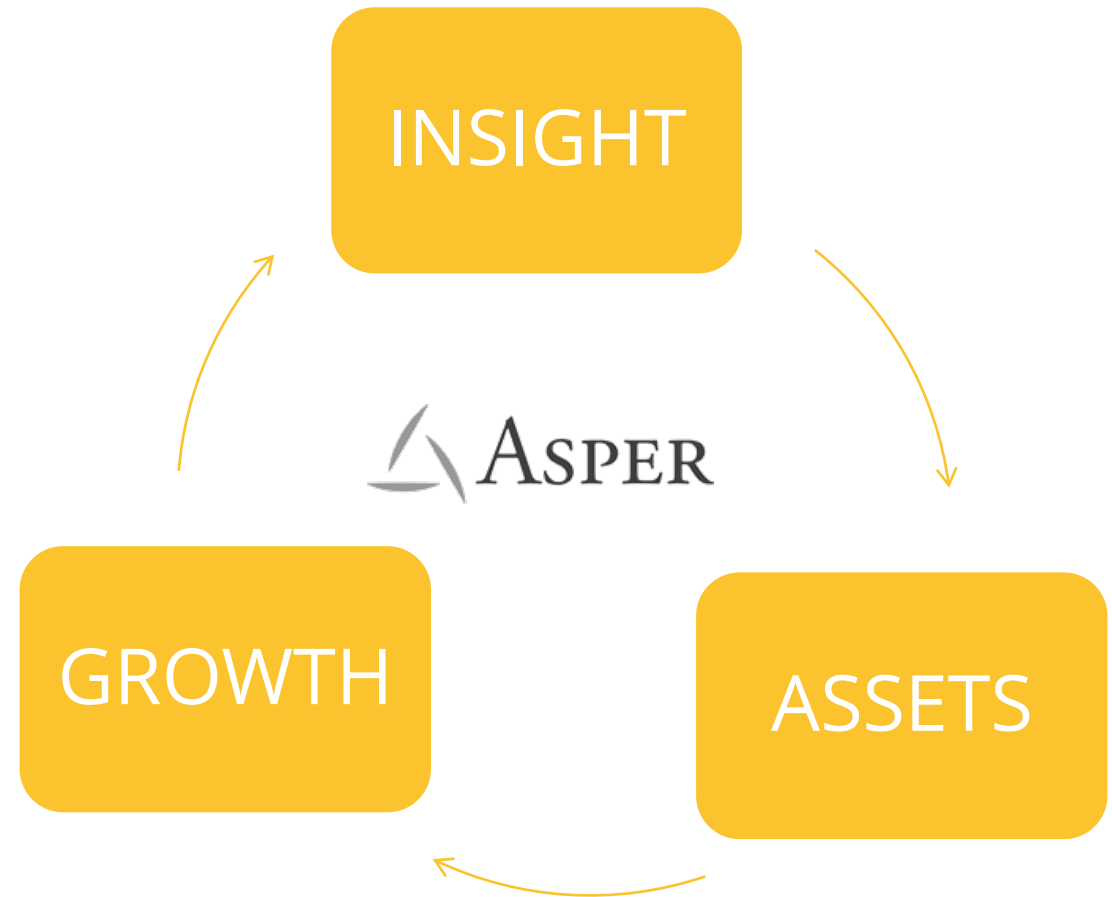
Source: Asper Investment Management research

- Acceleration of brownfield DH deals in Europe from 2017 – predominantly in Nordics
- Re-rating of asset class as “infrastructure” attracting funds and institutional investors → valuations more than doubled to >20x EV/EBITDA
- All assets sold were operational, cash-generative high temperature networks

# ...but greenfield DH networks require a different approach

## KEY CHALLENGES

- Multiple stakeholders
- Regulatory uncertainty
- High upfront capex
- Demand uncertainty (upfront)
- Drive to decarbonisation and low temperatures





# Our approach: Infrastructure Growth Equity

**We support entrepreneurial developers** with our capital, our experience and our work.

Our goal is to **accelerate growth** of our partners and the transition towards a sustainable future.

- **Platform approach:** Asper looks to back entrepreneurs over many years, to help them build market-leading sustainable infrastructure businesses
- **Asper supports its partners** with a combination of:
  - Construction equity
  - Development/ growth equity
  - Raising and executing debt project financing
  - Sourcing and executing expansion M&A
  - Hands-on assistance with growing their business: strategy, organization, market intelligence



# Thank you



**CONTACT:**

ALLISTER SYKES

[allister.sykes@asper-im.com](mailto:allister.sykes@asper-im.com)



# Polhem Infra



**POLHEM**  
INFRA

M

# The AP-funds and their missions

Polhem infra is founded and owned to equals shares by The First, The Third and The Fourth AP-funds

## Mission of the AP-funds

**The mission of the AP-funds is to manage pension capital for the public pension system, for today's and tomorrow's pensioners.**

The general pension consists of income pension and premium pension. The AP Funds (AP1, AP2, AP3, AP4 and AP6) manage the buffer capital in the income pension system. The Seventh AP Fund (AP7) manages capital in the premium pension system.

By the end of June 2022 AP1, AP3 and AP4 together managed SEK 1 450 billion.



Första AP-fonden (AP1) manages part of the capital in Sweden's national income pension system.

AP1s assets of SEK 466 billion are distributed across a global portfolio consisting of equities, fixed-income securities, real estate, infrastructure, private equity funds and hedge funds.

AP1 invest sustainably and long-term, and practise responsible ownership.

## AP3

AP3s overarching mission is to manage the fund capital in the best interests of the income pension system by generating high returns at low risk.

Total fund capital amounted to SEK 503 billion at the end of June 2022.

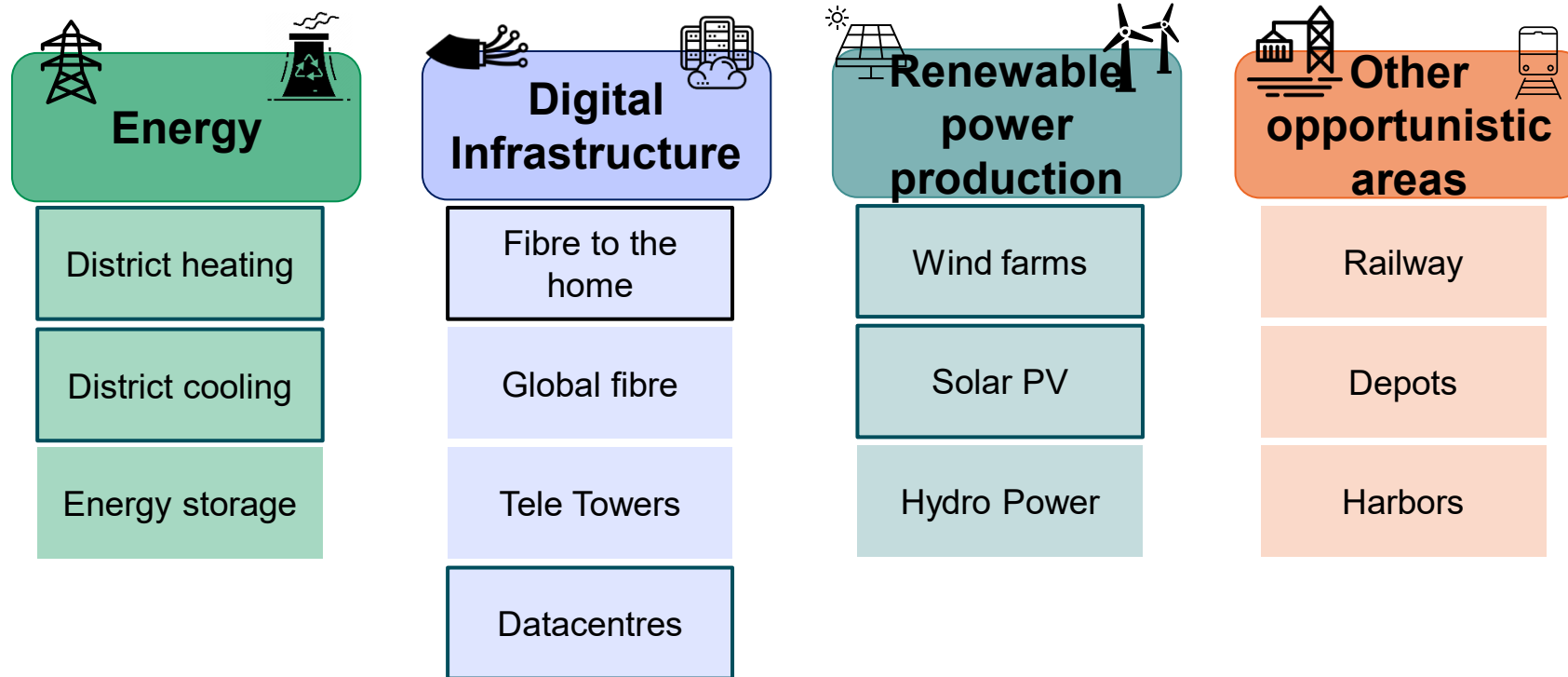


AP4's mission is to contribute to the financial security of current and future pensioners in Sweden by managing part of the national pension system's buffer capital. AP4's long-term perspective, responsibility as an owner and strong commitment to sustainability create opportunities for high returns at a low cost.

Total fund capital amounted to about SEK 500 billion at the end of June 2022.

# Polhem Infra Investment focus

Polhem Infra has identified priority sectors in which investment opportunities will be perused.





*REWARDHeat*

*Coffee Break*

14:30 – 15:00

# *Pitch Session*



Helsingborg and Mölndal demo site: Håkan Knutson – Managing Director, Indepro

Szczecin demo site: Lilli Wolny – Project Manager, Szczecińska Energetyka Ciepła (SEC)

Feedback from:

- Allister Sykes (Asper-IM)
- Anders Ericsson (Adven/Värmevärden)
- Tobias Popovic (HfT Stuttgart)

## REWARDHeat DHC Investor Perspectives

Pitch Session by REWARDHeat demonstrator networks Helsingborg and Mölndal demo site

Håkan Knutson – Managing Director, Indepro  
Thomas Wildig – Managing Director, Arvalla

In collaboration with:



ÖRESUNDS  
KRAFT

Supported by:





# Target group: Investors

## A) Owner of a district heating system

new built  
existing

Regardless of temperature levels

Other type of investor could be

- B) building property owners
- C) Third party energy module owners



# Context

Scarce resources for heating and required reduction of emissions:

No fossil fuels (oil, gas, coal)

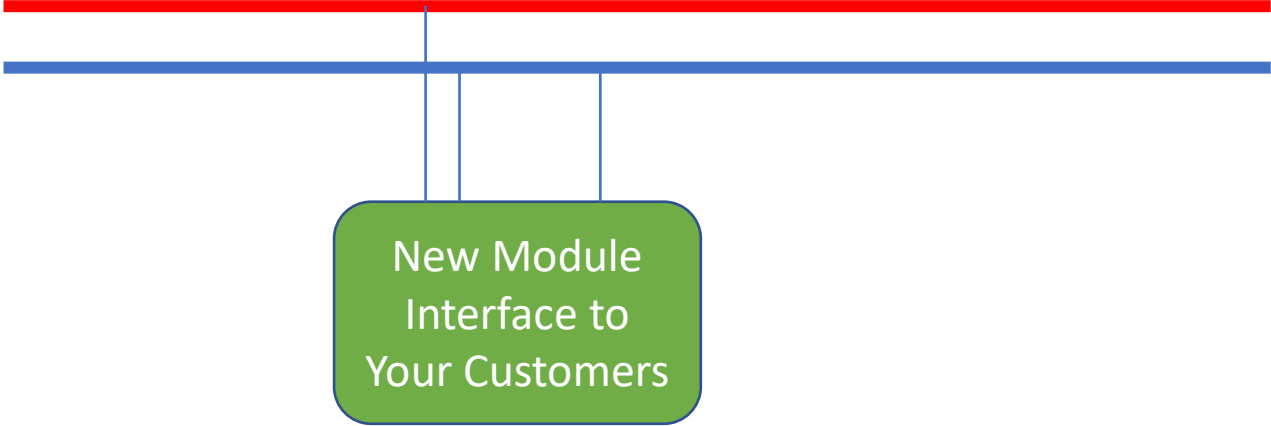
Lower volumes of combustible waste

More expensive biomass

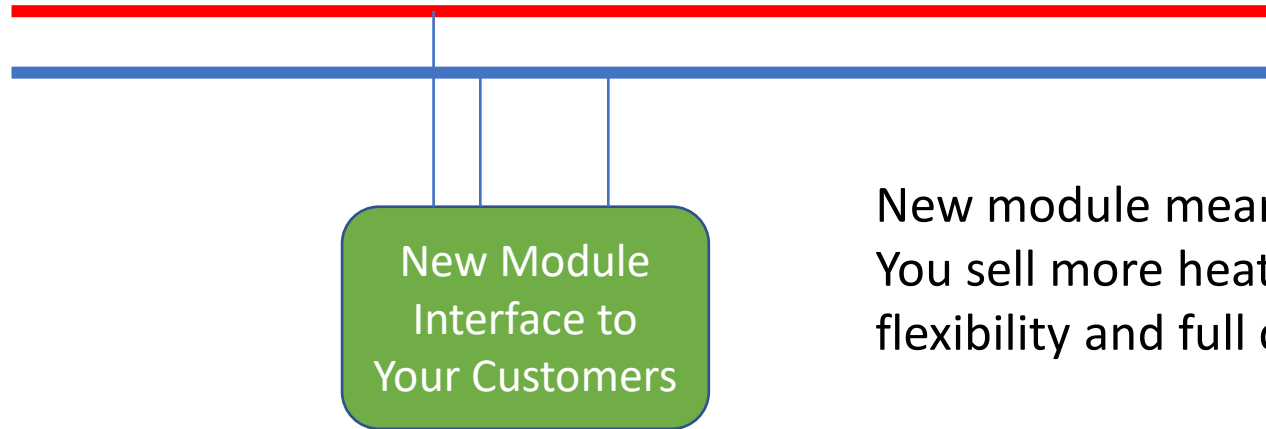
Volatile electricity supply, unpredictable price max/min related to capacity



# Our offer to your DH network platform



# Benefits for you – as heat supplier



New module means:

You sell more heat at your choice – more flexibility and full compatibility

To any temperature (above 10°C)

At any volume (capacity)

At any chosen time of the year

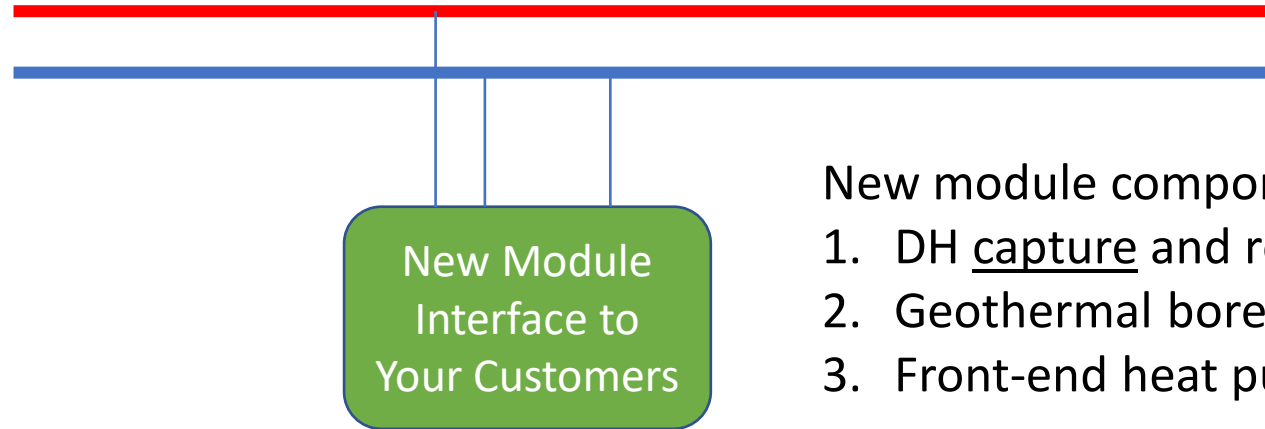
Minimum capacity taken from distribution grid

More power from your CHP

Comfort cold to customers – new revenue



# Function of the Module – well proven components in new combination



New module components:

1. DH capture and re-distribute heat
2. Geothermal boreholes store heat and provide cold
3. Front-end heat pumps customize heat (JIT)

Peak power mitigation

Power purchasing at low price

Option to add module for DH driven power supply

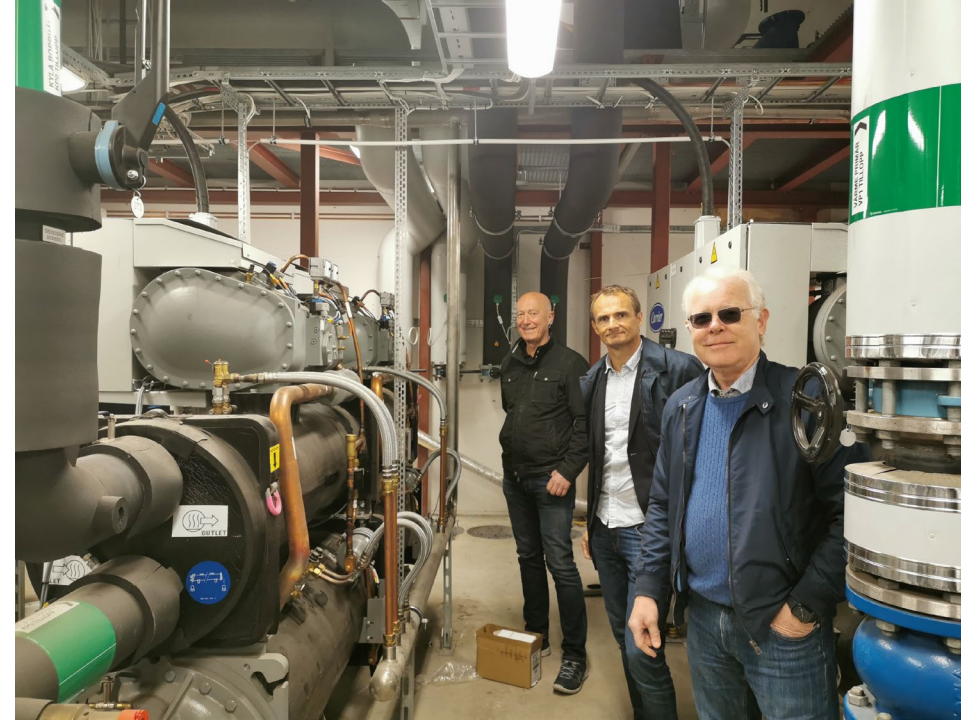
500-1000 kW heat





# Energy Balance – Heat – and CO2 profile

District Heating	+272 MWh
Free Cooling/Vent	+45 MWh
Heat losses boreholes	-60 MWh
Electricity to HP compressors (SCOP7)	+43 MWh
Heat to customers	+300 MWh
Cooling to customer	+45 MWh



Scalable from 100 MWh to 6 000 MWh or higher. Start price at EUR 200 K per module.

## CO2-profile:

District Heat is recovered surplus heat with zero CO2

Cooling is free cooling from boreholes with zero CO2

Electricity consumption (Nordic Mix) can be optimized to minimum CO2



# Financial

Estimated ROI/pay back time: 7-10 years

Estimated IRR: 8-10%

Investment life time (depreciation time): more than 30 years  
(15 years at heat pump compressor)

Technical Risks: Low, well proven components

Energy system Risk: Very low probability that a customer switch to other solution

Commercial Risks: Contract specific

Scalable

Compatible





# Contact

Please note that this is not a commercial offer.

Contact:

[hakan.knutsson@indepro.se](mailto:hakan.knutsson@indepro.se)

+46 733 347977



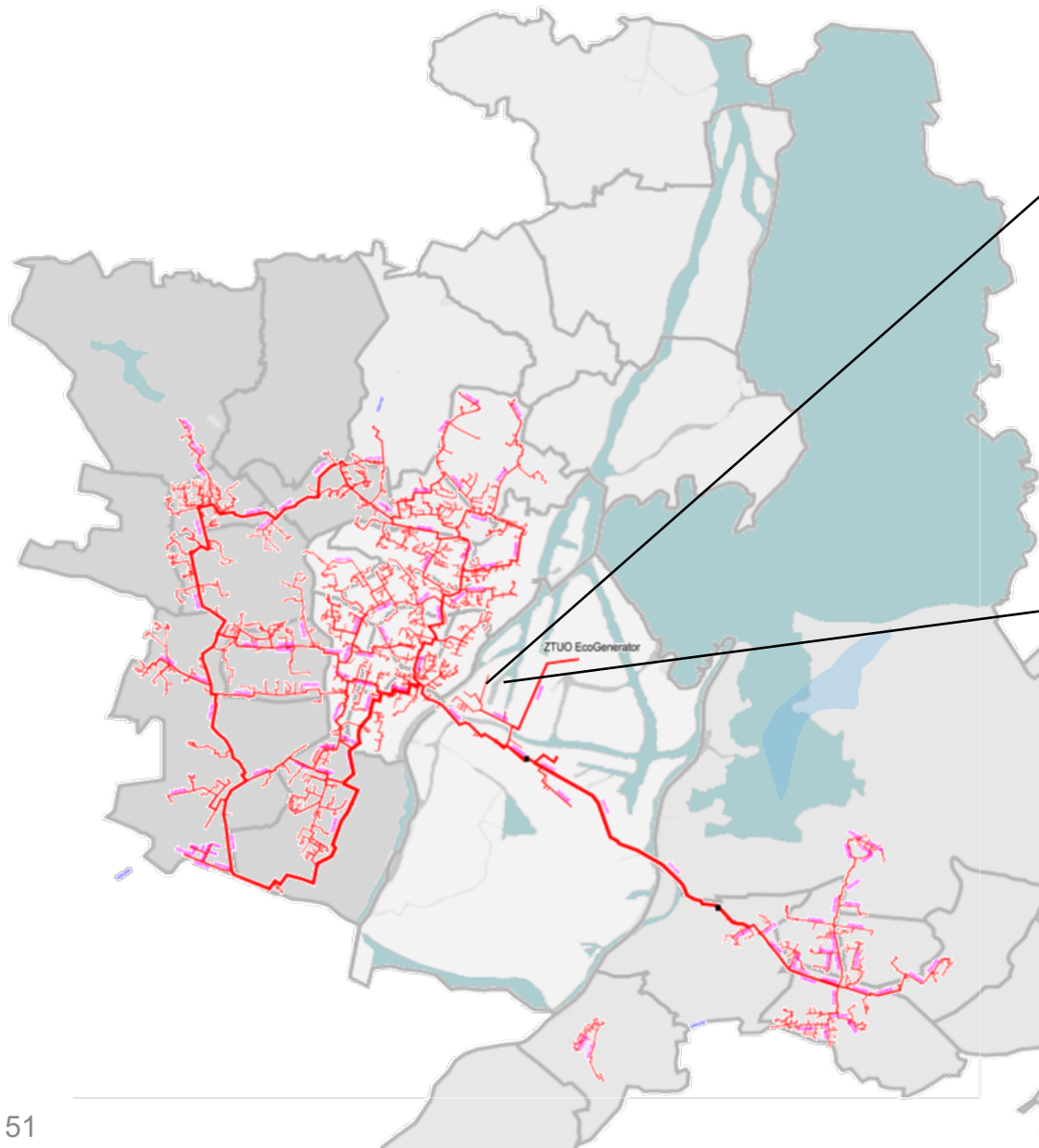


# REWARDHeat Project Demo case in Szczecin, Poland

Helsingborg

16.06.2022

# Łasztownia Island - location



# Łasztownia – New Heart of the City



SZCZECIŃSKA  
ENERGETYKA  
CIEPLNA

powered by

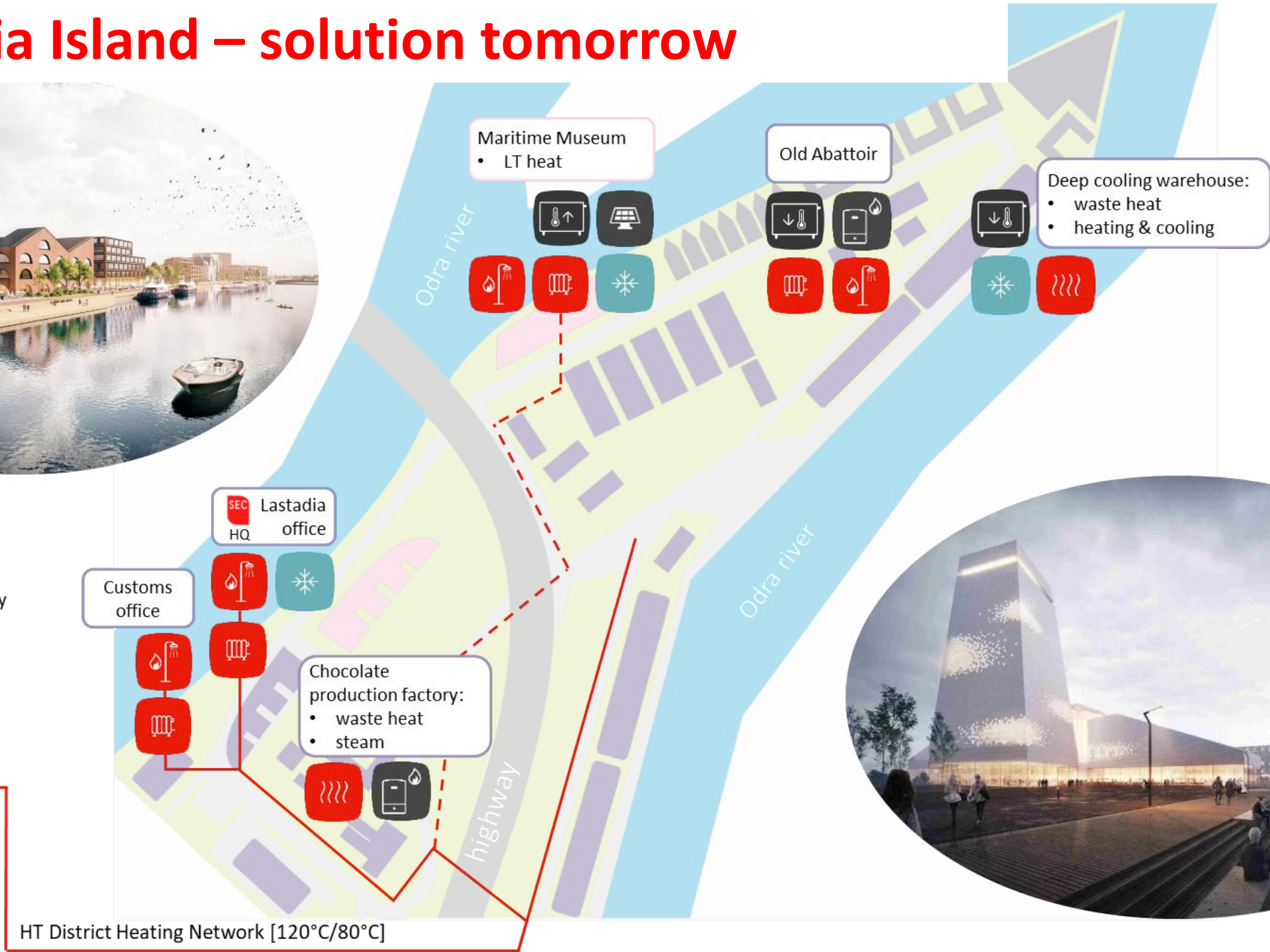
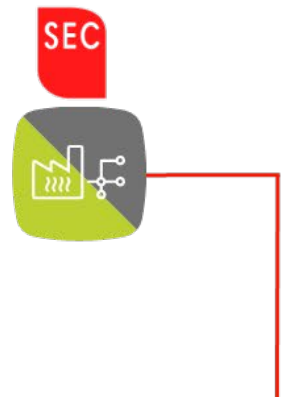
*e-on*

# Łasztownia Island – solution tomorrow



- Existing
- Planned shortly
- Planned in long term

- DH grid
- Existing
  - Planned shortly

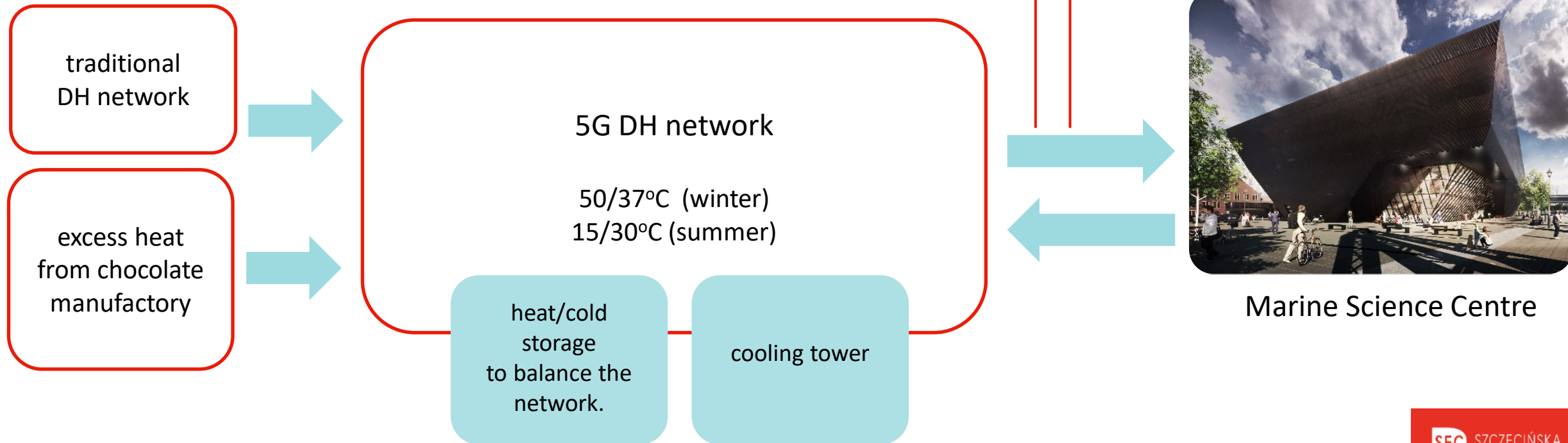




# Łasztownia Island – 5G DH network

domestic hot water prepared locally, by MSC, used solar thermal collectors/ heat pump

- 5G DH network
- thermal storage
- cooling machines
- substations combined with heat pumps

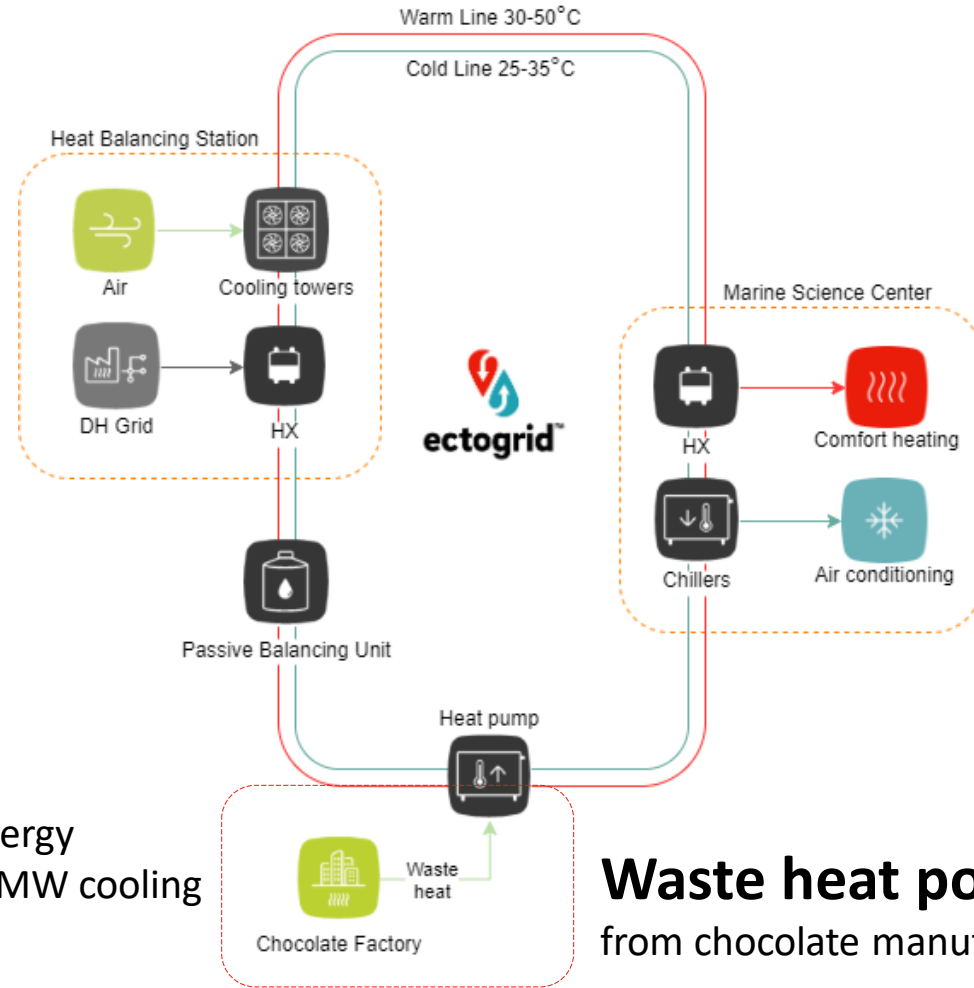


# Project description



## Heating Balancing Station

- up to 1,2 MW heating via DH
- central 800 KW cooling with air coolers
- passive Balancing Unit storing up excess energy
- possible extension to 3,5 MW heating, 2,4 MW cooling

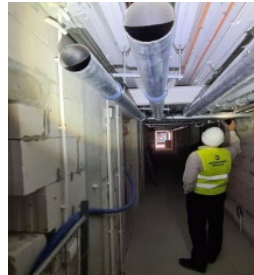


## Marine Science Center

- low temperature comfort heating
- air conditioning with use of chillers
- partial heating of DHW

## Waste heat potential

from chocolate manufactory



2019

2020

2021

2022

09.2023



# Benefits and challenges



## Benefits of solutions on Łasztownia island

- ✓ Cooling production
- ✓ Reduction of heat losses
- ✓ Possibility of using waste heat from buildings
- ✓ Establishing prosumer relationships and strengthening cooperation with waste energy generators
- ✓ A step towards decarbonization of the energy sector in the area and support of alternative transport by creating charging stations for electric cars
- ✓ Scalability of the project
- ✓ Creating opportunities for RES usage



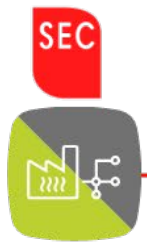
## Challenges of the project

- ✓ Problem with integration of existing buildings in Łasztownia
- ✓ Need to divide the project into stages
- ✓ Connecting new buildings to the network

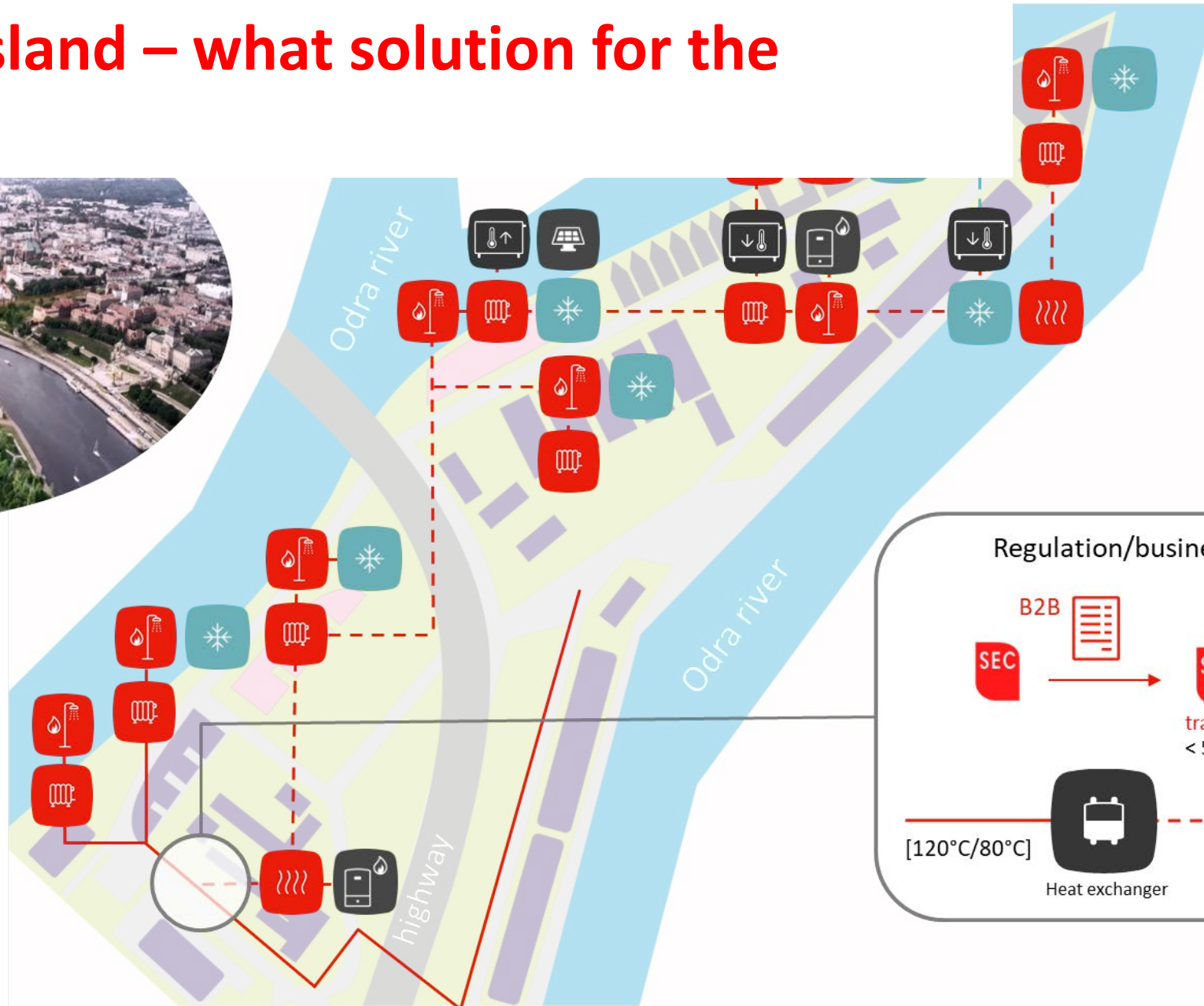
# Łasztownia Island – what solution for the future?



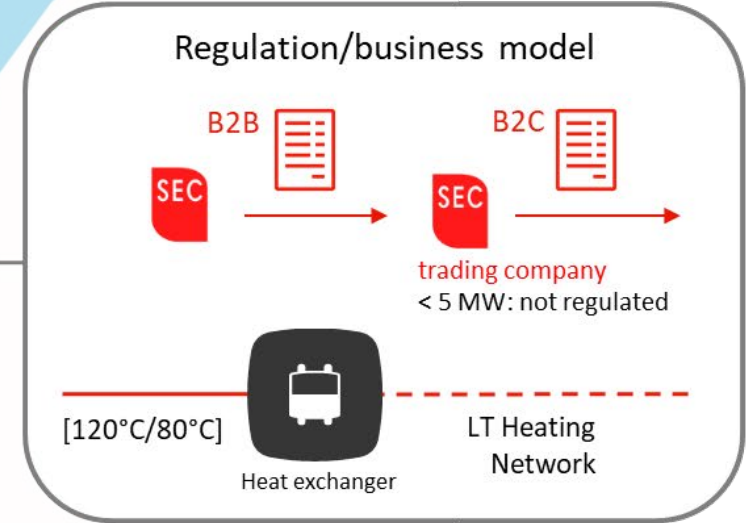
DH grid  
 — Existing  
 - - - Concept



HT District Heating Network [120°C/80°C]



Existing  
 Planned shortly  
 Planned in long term



Thank You for your attention!

## *Slido Poll*



Join at [slido.com](https://slido.com) with #3151678

- Would you invest in the demo networks that have been presented?



*Thank you*

[www.rewardheat.eu](http://www.rewardheat.eu)



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