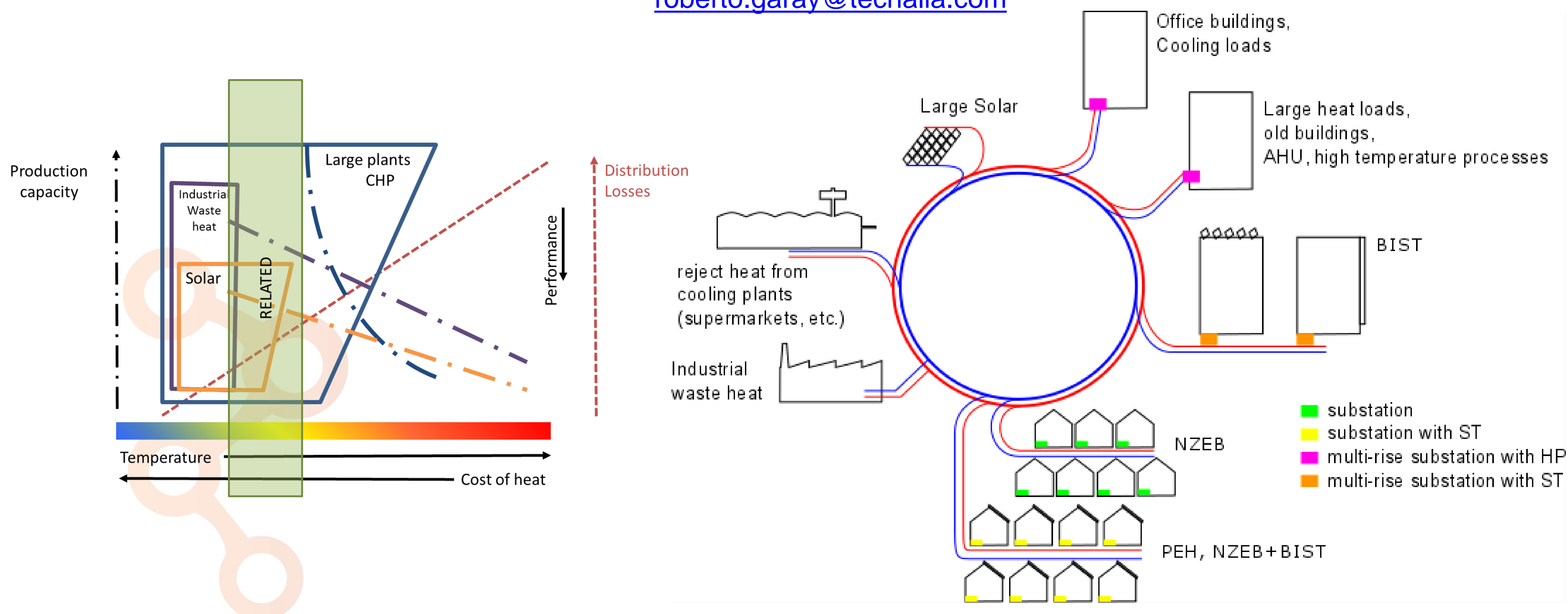


RELaTED, A FLEXIBLE APPROACH TO THE DEPLOYMENT AND CONVERSION OF DH NETWORKS TO LOW TEMPERATURE, WITH INCREASED USE OF LOCAL SOLAR SYSTEMS

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The RELaTED concept

- An Ultra-Low Temperature (ULT) System ($\sim 45^{\circ}\text{C}$) which facilitates the incorporation of renewable energy sources and reduces heat loss
- A decentralized Dh network with Buildings acting as energy nodes, where substations allow for bi-directional heat exchange
- Incorporation of low-grade heat sources: District-heating connected Reversible Heat Pump systems (DHRHP) allow for recovery of exhaust heat from cooling applications (e.g. air conditioning, ventilation, supermarket cooling, etc.).
- Decentralized solar thermal: Building Integrated Solar Thermal (BIST) systems are adapted to Low Temperature (BILTST)
- Proliferation of prosumers, where ST systems in NZEB, and Plus Energy Houses are net heat producers for the DH network.

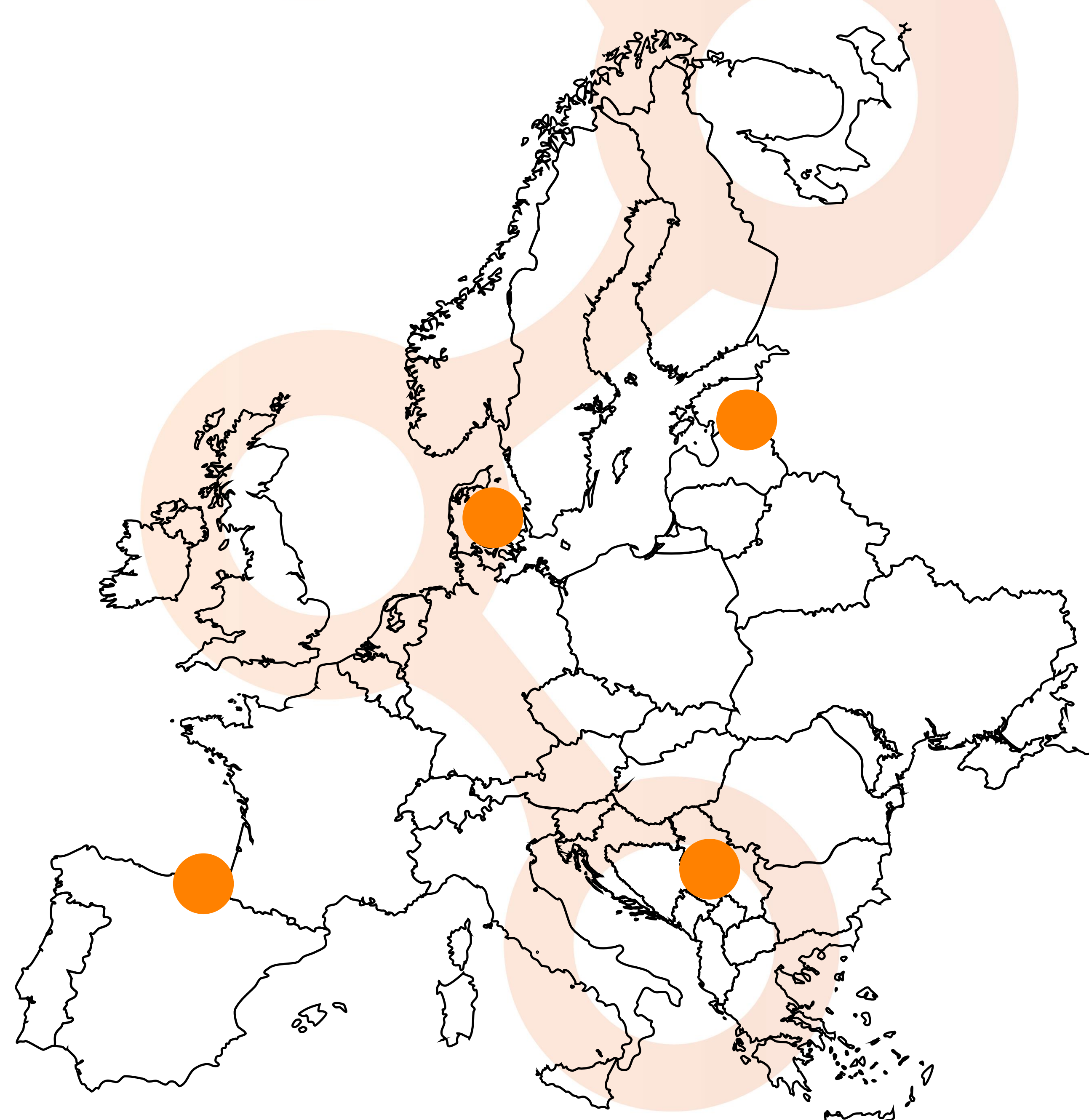
Advantages

- Performance improvements by factors 2 to 5 in CHP heat production plants due to ULT temperature
- Integration of low-grade/low-cost waste heat streams at ULT
- Performance improvement of ST systems due to LT connection to DH
- DHRHP to compatibilize heat sources and loads, with COP levels of 6-7 all-year-round.
- DHRHP are and an economic way for the preparation of DHW

Expected development

RELaTED will be demonstrated in 4 selected locations:

- Green field development in VINGE, DK
- DH network with large share of biomass in TARTU, EE
- Large DH network with incorporation of large RES resources in BELGRADE, SR
- Corporate DH network in IURRETA, ES



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