

PROCESS OF ENERGY MASTER PLANNING OF RESILIENT COMMUNITIES FOR COMFORT AND ENERGY SOLUTIONS IN DISTRICTS

Matthias Haase, PhD

Senior research scientist

SINTEF Community

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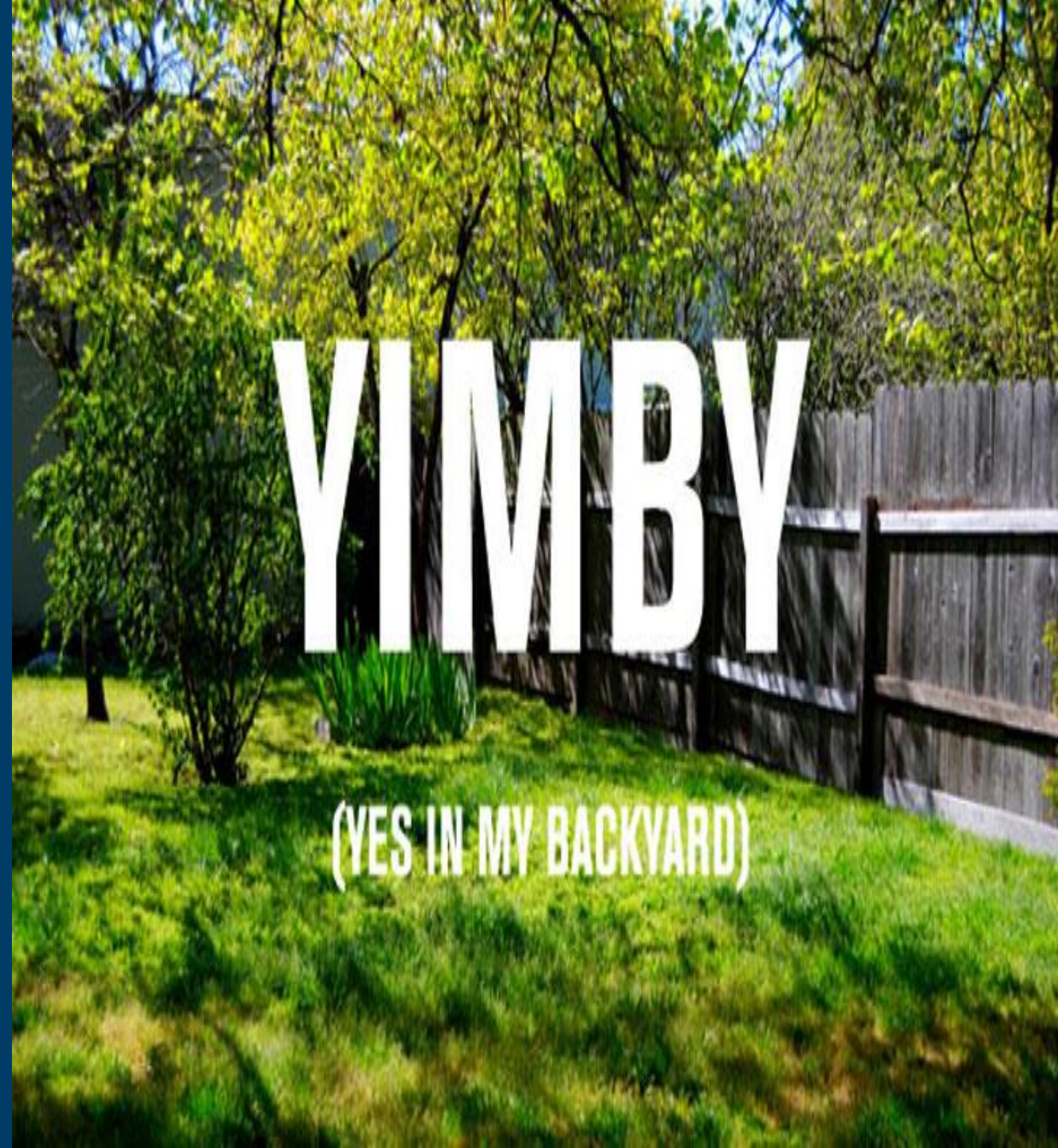
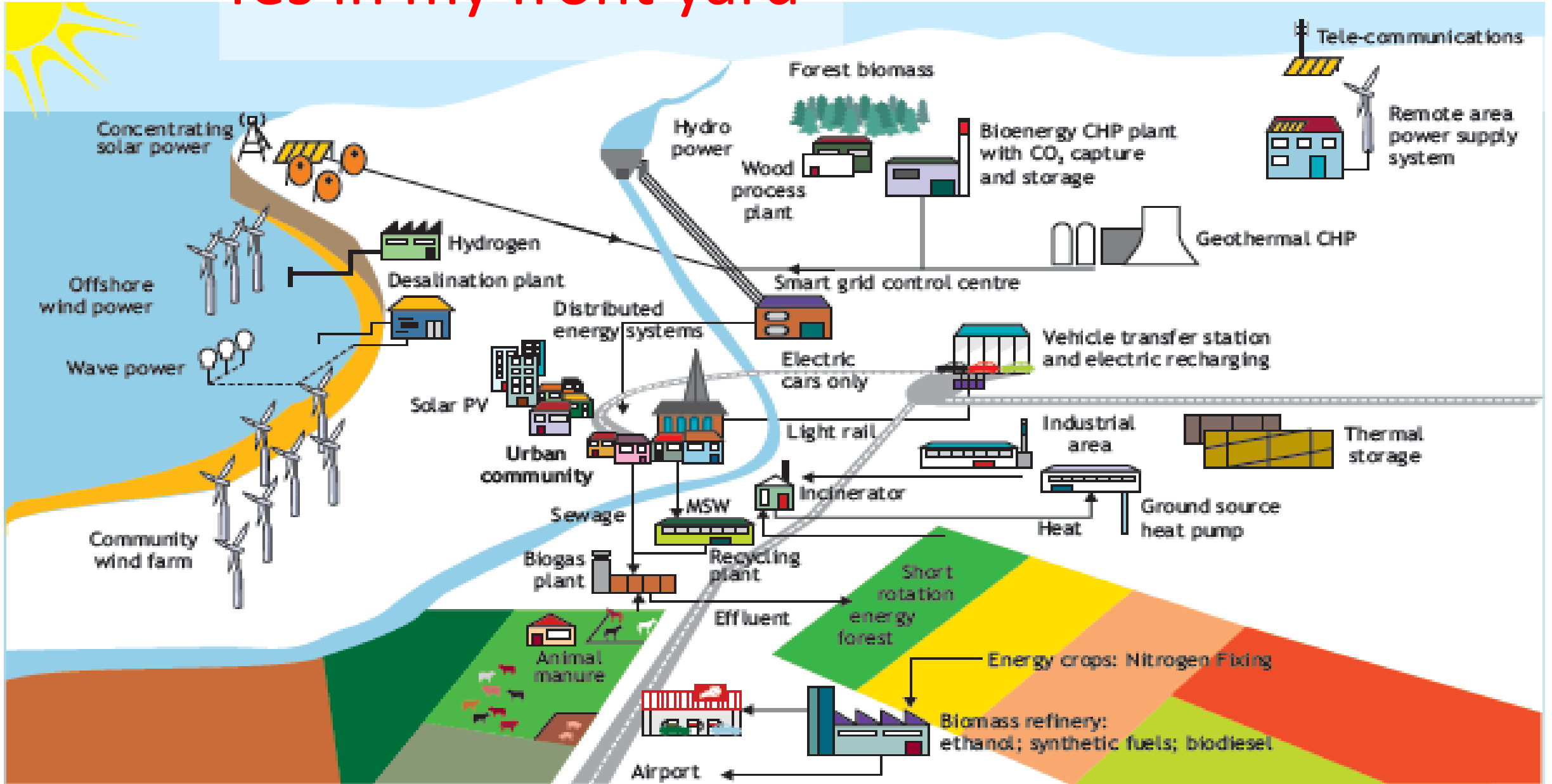
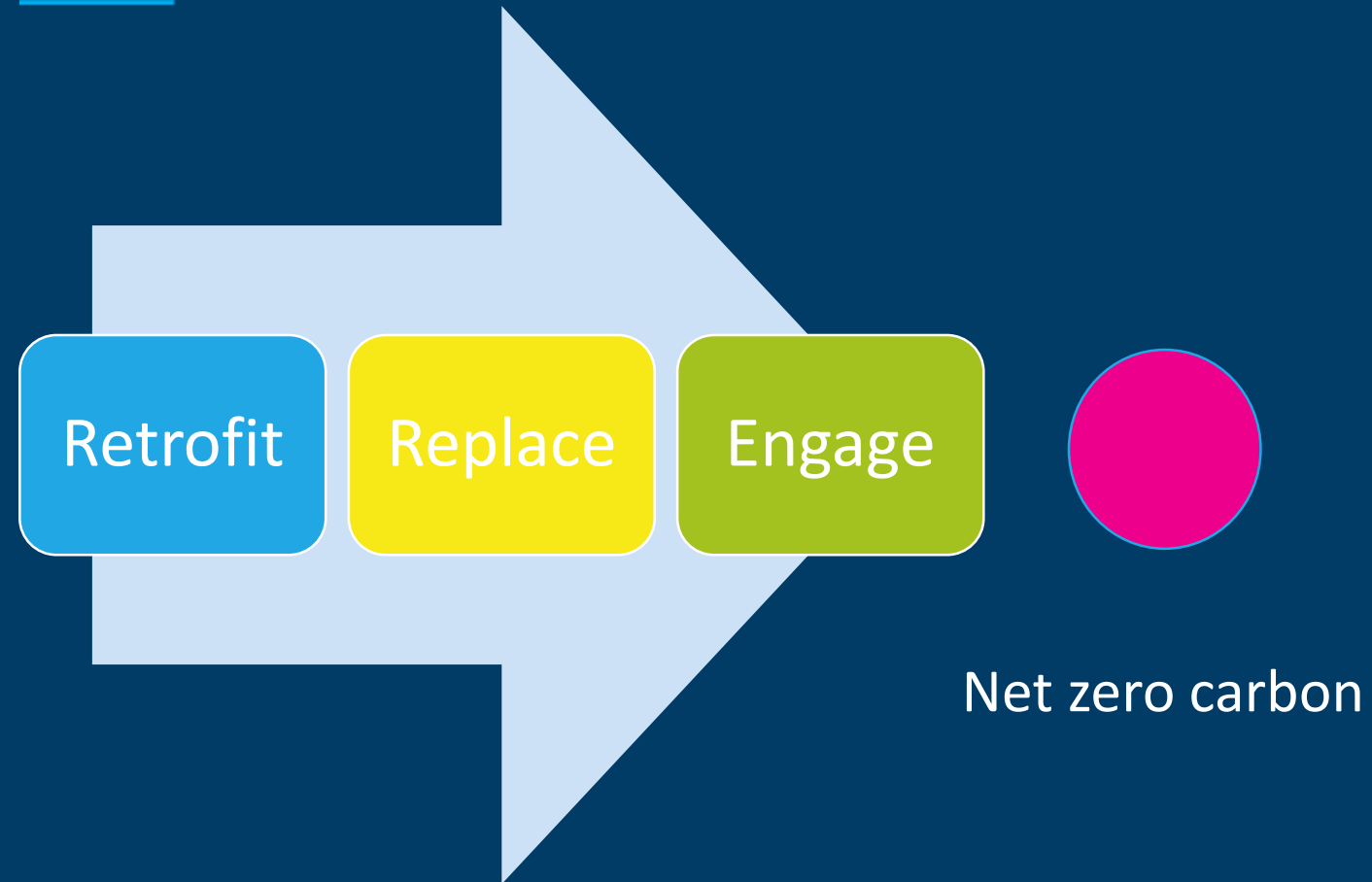


Figure 3 - Producing significant shares of heat, power and biofuels from locally available resources including solar, wind, ocean, geothermal, energy crops and biomass from wastes, could be a future option for a municipality

Yes in my front yard

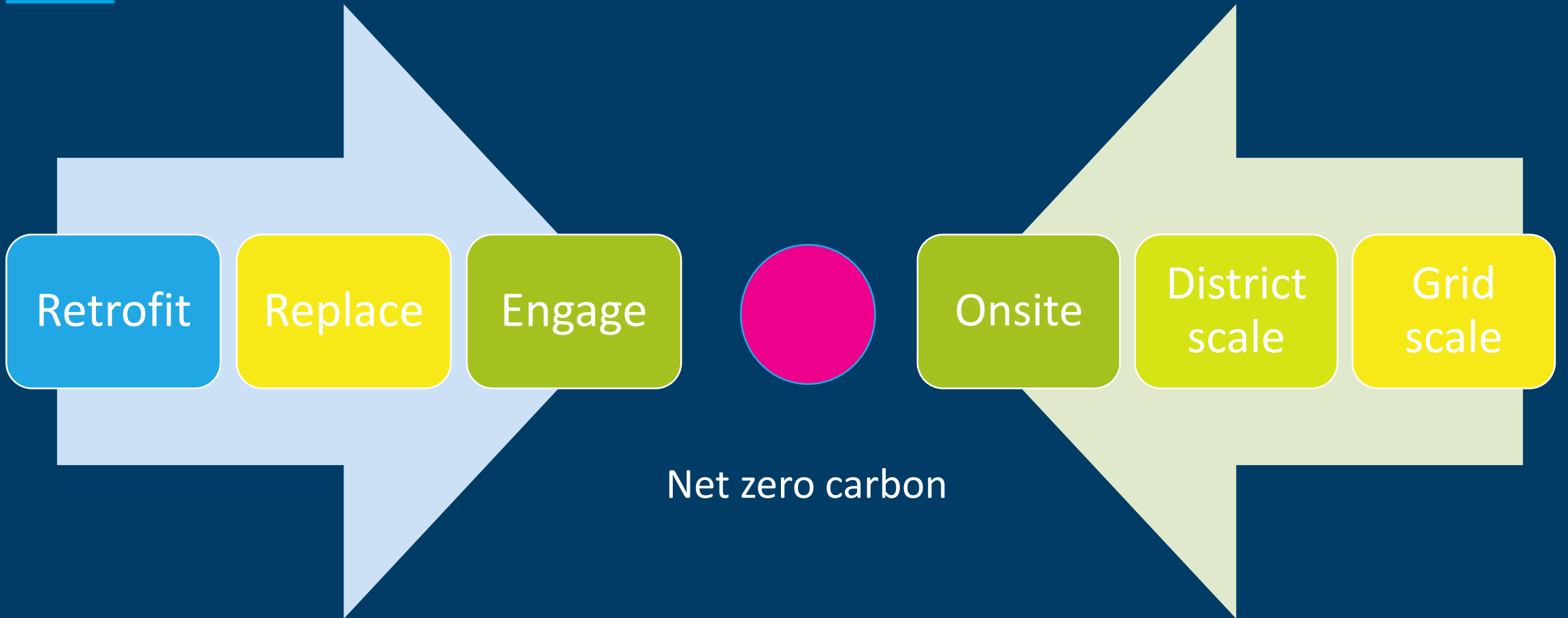


Introduction



Demand side

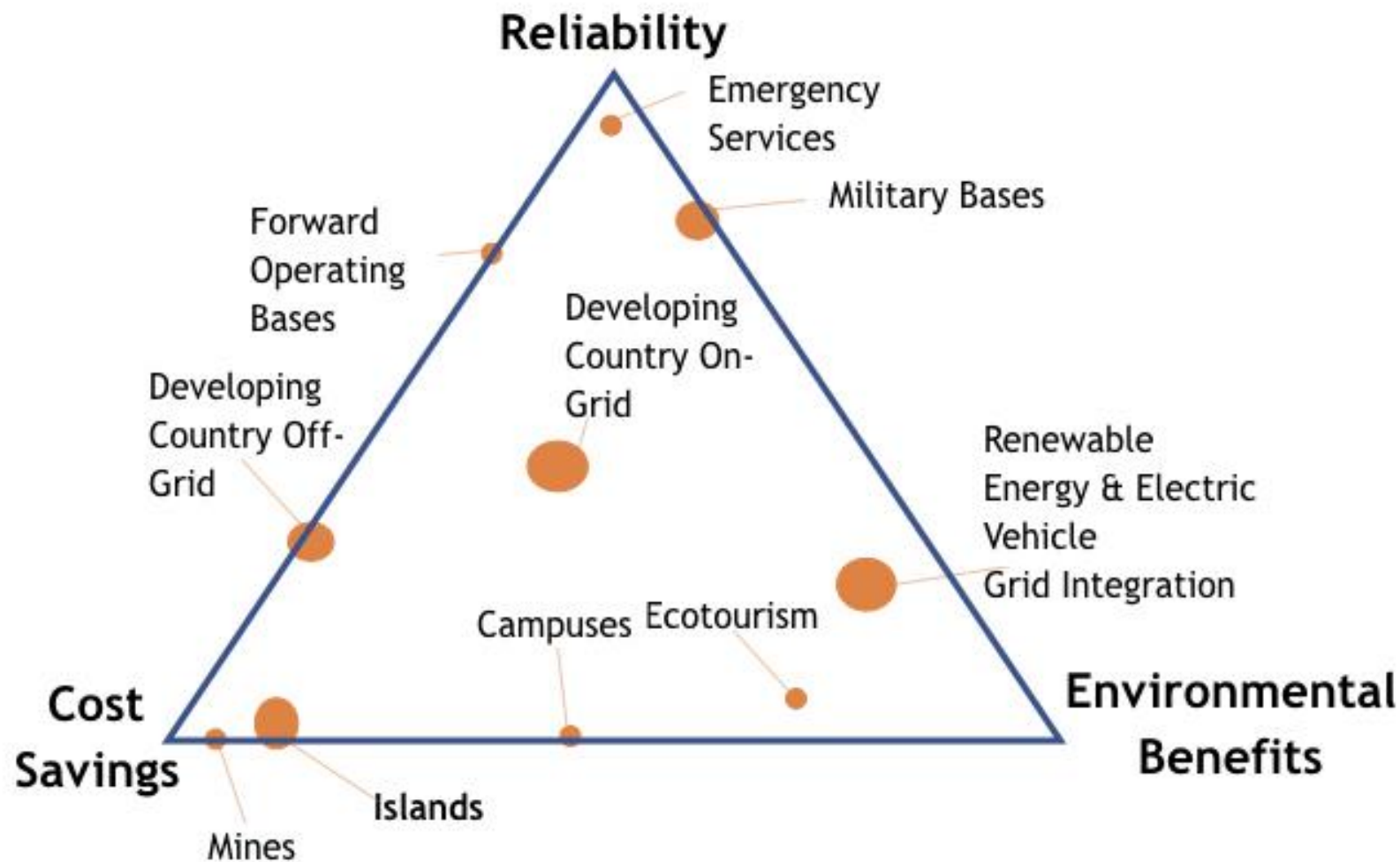
Supply side



Background



Microgrid Value Proposition



Annex 73

Subtask A

Collection and Evaluation of Input Data for Energy Master Plan (EMP).

Subtask B

Collection of Existing Case Studies and implementation of pilot studies.

Subtask C

Description of existing and innovative technologies, architecture and calculation tools for performance of central energy systems (power and thermal).

Subtask D

Develop Guidance for Net Zero Energy Master Planning.

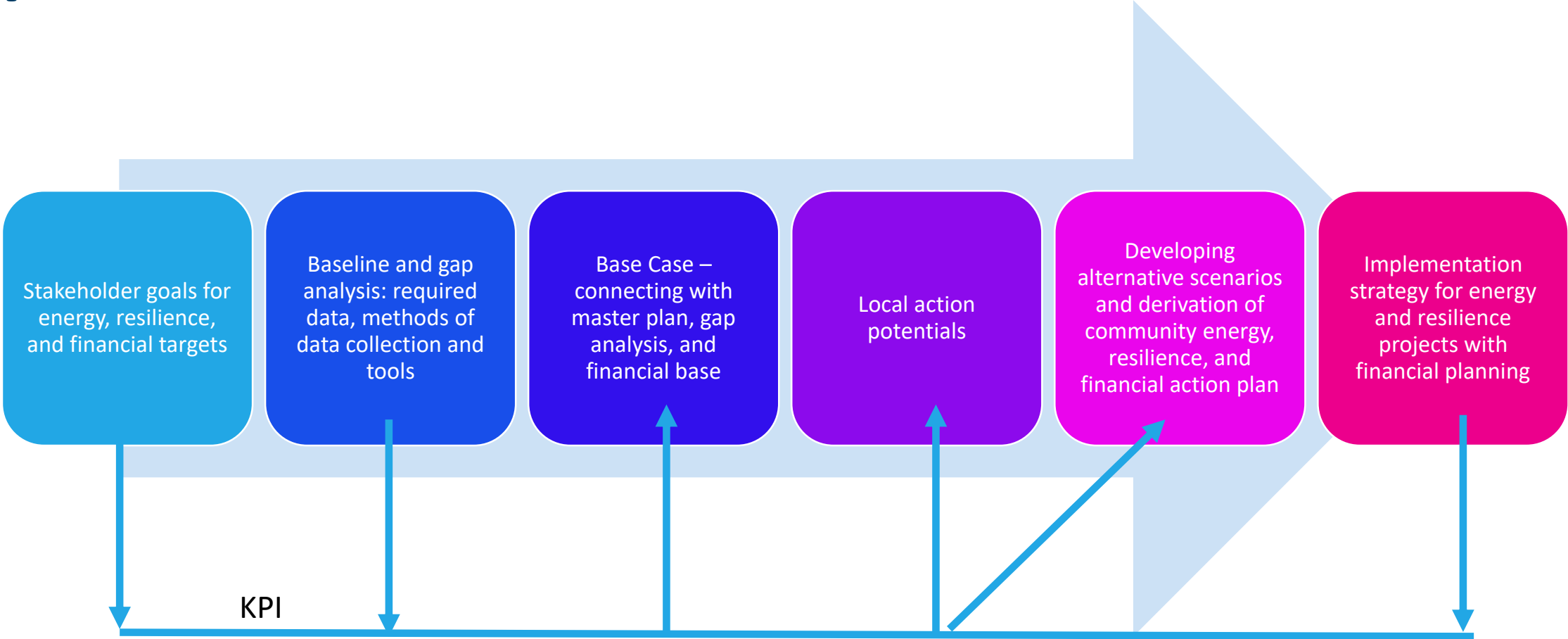
Subtask E

Develop a functional modeling tool to facilitate the Net Zero Energy Resilient Communities Master Planning Process.

Subtask F

Business, legal and financial aspects of Net Zero Energy Master Planning.

Community Energy Master Planning (EMP) process



Constrains in EMP



Natural Constraints

Locational Threats

Locational Resources



Imposed Constraints

Distribution Systems & Storage

Building and Facility

Indoor Environment

Building Equipment and District System

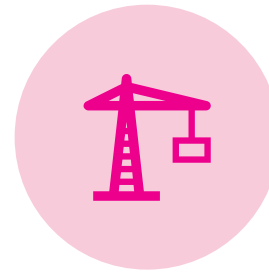
Discussion



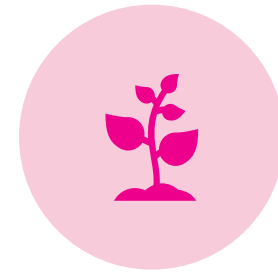
FULL POWER,
HEATING, COOLING
BACK-UP



BUILDING
INSTALLATION



BUILDING
CONSTRUCTION



INDOOR
ENVIRONMENT

Conclusions

- bottom-up vs. top-down implementation
- bottom up EMPs often appear in design challenges with ambitious targets such as energy efficiency, resilience, short implementation time or other imposed constraints.
- One approach is to initiate a “net zero” compound or other limitations on the EMP process.
- Then the design challenge is “how can we match these ambitious energy targets under those fuel and carbon footprint constraints”

Conclusions (cont.)

- discussion is moving from the single building towards targets of a community of buildings.
- The adoption of EPBD 2018 will have to be translated on the level of a community.
- This provides certain flexibilities for the constraints on the building level, e.g. if a historic building cannot fulfill the target values on the building level, buildings in the neighborhood or an energy supply based mainly on renewables can compensate the “failure” of the individual.

Further work

- Computer-based models for base case development need to be customized.
 - Archetypes to predict energy use in districts adapted to different requirements.
 - List of site-specific constraints is needed to help determining the solution room.
 - International comparison and benchmarking is needed.
-
- IEA EBC Annex 74: <http://annex73.iea-ebc.org/>

Thank you!

The banner features a dark blue header with navigation links: SSPCR 2019, HOME, TRACKS, CALL, COMMITTEES, VENUE, PAST, NEWS. The main area has a blue background with various icons representing smart and sustainable planning, including a graduation cap, a lightning bolt, a factory, a building, a car, and a wind turbine. A prominent orange banner on the right says "REGISTRATION IS OPEN!". The text "Session on PEDs" is written in white, slanted font across the middle. At the bottom, it reads "3rd International Conference on Smart and Sustainable Planning for Cities and Regions 2019 09. – 13.12.2019, Bolzano, Italy".

SSPCR 2019 HOME TRACKS CALL COMMITTEES VENUE PAST NEWS

REGISTRATION IS OPEN!

Session on PEDs

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<http://www.sspcr.eurac.edu/>

The logo is enclosed in a light blue rounded rectangle. It features the IBPSA NORDIC logo on the left, followed by "BSN2020" in large red letters. Below this is a stylized waveform graphic with red and blue peaks. At the bottom, it says "BuildSim-Nordic2020" and "Oslo, Norway 13.-14. October 2020".

IBPSA NORDIC

BSN2020

BuildSim-Nordic2020
Oslo, Norway 13.-14. October 2020

<https://buildsimnordic2020.ibpsa-nordic.org/>



Technology for a better society