



CASE
STUDY

Case Study



Clean Energy

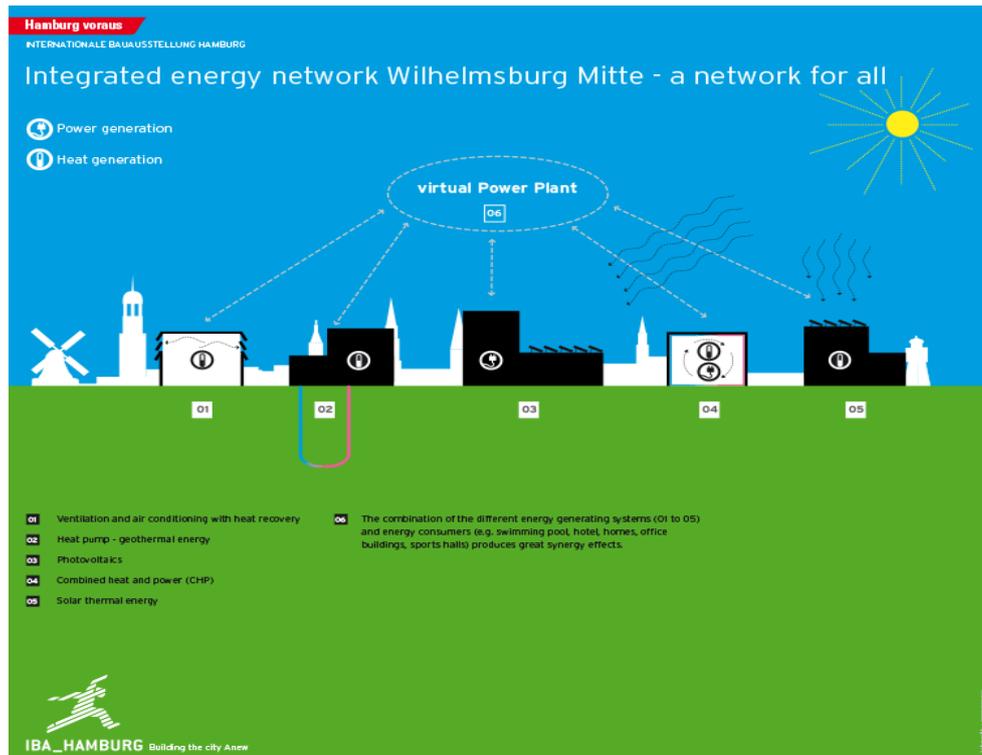
Hamburg, Germany - Integrated Energy Network Wilhelmsburg Mitte

Hamburg's International Building Exhibition (IBA) demonstrates through its Cities and Climate Change programme how major cities can grow in an environmentally friendly way by generating decentralized renewable energy and using their own resources efficiently. The Wilhelmsburg and other Elbe islands are industrial, harbor and working class neighborhoods with approximately 100,000 inhabitants in the southern parts of Hamburg, within the river Elbe also including nature conservation areas and even agriculture. Hamburg has oceanic climate, influenced by the North Sea. The Hamburg International Building Exhibition (IBA) from 2007 to 2013 was the location for 50 individual projects in the Wilhelmsburg district and on the neighboring Elbe Islands as well as at Hamburg's inland port. The Cities and district Climate Change initiative has set the objectives:

- 100% renewable Wilhelmsburg in the long run;
- Localized energy: Elbe islands energy should become largely energy autarkic, heat pumps, geothermal, bioenergy, wind and solar, with local energy grids (mini-grids and virtual power stations);
- energy efficient buildings, highest standards, focus on existing building stock;
- climate change mitigation and adaptation as community concern.

A specialty is the parallel development of concepts (energy mapping and planning) and projects, due to the fact that the building exhibition requires visible objects. Some extraordinary projects which explore directions and symbolize the concepts:

Integrated Energy Network Wilhelmsburg Mitte, Hamburg, Germany



Source: <http://www.iba-hamburg.de/en/druckansicht/projects/energieverbund-wilhelmsburg-mitte/projekt/integrated-energy-network-wilhelmsburg-central.html>

Energieverbund Wilhelmsburg Mitte: a heating energy grid and 'virtual power station' including some storage, connecting user and decentralized heat providers; buildings involved produce temporarily more heat than needed and feed into the grid; the aggregated and variable heat demand is covered by the variable inputs from heat pumps, solar thermal, geothermal and distributed cogeneration on the basis of biomethane; this system is called virtual power station since it reduces capacity requirements for the individual building; on the demand side low energy standards are attained.

- Some extraordinary projects generate the heat; a building with a green solar thermal façade, (smart is green), the BIQ house which explores facades in which micro-algae generate heat and also the water houses built on water using geothermal heat, groundwater heat pumps and again, solar thermal elements;
- The energy bunker is a high profile building: it is a WWII high bunker, inside of which a CHP station is accommodated, and on which a roof of solar PV arrays have has been installed.
- The Georgwerder energy hill, which is a land fill mound, from which land fill gas is extracted, used also in an industrial plant nearby, as well as a field solar PV array and a wind turbine on top;
- The Jenfelder Au demonstration and research project is aimed at finding holistic, innovative, exemplary and future-oriented solutions in order to intelligently combine urban wastewater management with energy provision and urban design requirements.

Since the IBA exhibition ended, research and analysis continues. Today, the city and the district pursue the 100% renewable Wilhelmsburg concept more systematically.

The success of the renewable energy programme of Germany became evident in 2016 when it was reported that the share of renewables in total energy balances had gone up so much that energy prices became negative (i.e below zero). This was possible due to the sale of energy generated to the grid of providers.

“Energy Hill” in Georgwerder, Hamburg



<http://www.iba-hamburg.de/en/projects/energieberg-georgswerder/projekt/energy-hill-georgswerder.html>

‘Energy Bunker’. Wilhelmsburg-Mitte Hamburg



<http://www.iba-hamburg.de/en/themes-projects/energiebunker/projekt/energy-bunker.html>

References

<http://www.iba-hamburg.de/en/iba-in-english.html>, <http://www.iba-hamburg.de/nc/projekte/stadt-im-klimawandel.html>

This country made so much clean energy it had to pay people to use it. 9 June 2016.

<https://www.weforum.org/agenda/2016/06/germany-made-so-much-clean-energy-it-had-to-pay-people-to-use-it/>

Pizarro, V. 2016. Energías renovables provocan que el precio de la luz fuera negativo en Alemania. 11 May 2016.

<http://www.capital.cl/negocios/2016/05/11/150506-energias-renovables-provocan-que-el-precio-de-la-luz-fuera-negativo-en-alemania>

Credentials

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