

Renewable energy for urban areas

Innovations & Aalto University

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June 25, 2014

Prof. Peter Lund's group New Energy Technologies

- Future energy systems + distributed generation
- Dye-sensitized solar cells + solar fuels
- Fuel cells (solid oxide)





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From old energy system to new

From centralized
 to distributed

 From fossil to renewable



From controllable
 to variable





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Cooperation between Aalto and Concepción

- Spatial energy demand
- Solar potential of the cities





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Role of an energy system

Always and everywhere: Demand (x,y,t) = Supply (x,y,t)



How?

• Grids, flexible generation, flexible demand, batteries, hydrogen, electricity-to-thermal



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Example: Helsinki + wind power

- Current situation:
 - large CHP power plants
 - City-wide district heating network
- Studied case:

Large offshore wind farm for Helsinki

+ heat pumps connected to heating network

→ thermal conversion enables 2–3 times larger wind farm



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Innovations in Aalto University



Aalto University

- Founded in 2010
 - Helsinki University of Technology
 - Helsinki School of Economics
 - University of Art and Design Helsinki





"Where science and art meet technology and business"



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Innovations

- An innovation is something original, new, and important in whatever field that breaks in to a market or society (Frankelius, 2009)
- New innovations were the main reason for creation of Aalto University

...but what does Aalto do to enable new innovations?





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Open Innovation House

- Venue for open innovation and collaborative creation
- Public spaces and activities
- Companies involved
 - incl. Nokia research center



Design Factory Urban Mill Energy Garage

- Open spaces for experimenting, teaching and hanging out
- Students, teachers, researchers and industrial partners under the same roof



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Aalto Center for Entrepreneurship (ACE)

- commercializes research that originates in Aalto University
- Help for researchers and students to develop their ideas



- Coaching and support for early-stage startups
- Accelerating the business





meetdoc MeeDoc - doctor in your iPhone

Aalto University School of Science

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Aalto Ventures program

- Courses and teamwork
 learning entrepreneurship
- Offers skills, tools and global networks to create new businesses

Aalto Entrepreneurship society (Aaltoes)

- Europe's largest student-run entrepreneurship society
- Organizes startup events
- Offers support and networks



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Thank you!



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