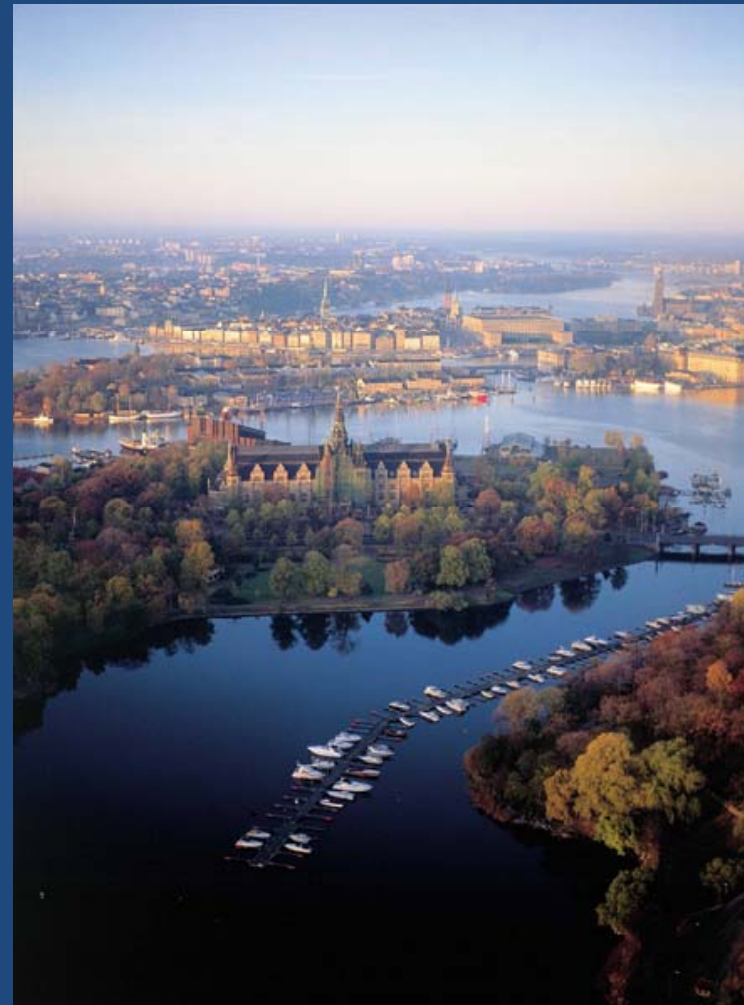


Ronald Wennersten
Department of Industrial Ecology
School of Engineering and Management, KTH



KTH was founded in 1827 and is the oldest and largest of Sweden's technical universities.

Since 1917, activities have been housed in central Stockholm, in beautiful buildings which today have the status of historical monuments.



Organisation at KTH

School of Industrial Engineering and Management

School of Electrical Engineering

School of Information and Communication Technology

School of Architecture and the Built Environment

School of Biotechnology

School of Chemical Science and Engineering

School of Computer Science and Communication

School of Engineering Sciences

School of Technology and Health

Research at the Department of Industrial Ecology

- Sustainability assessment of technology and technology chains
- Sustainable use of materials and energy in cities
- Environmental modeling
- Sustainable consumption
- Climate change strategies
- Risk and conflict management
- Ecological engineering

System Analysis of City metabolism

International Cooperation

Europe

Central Asia

USA

China

Cooperation with China

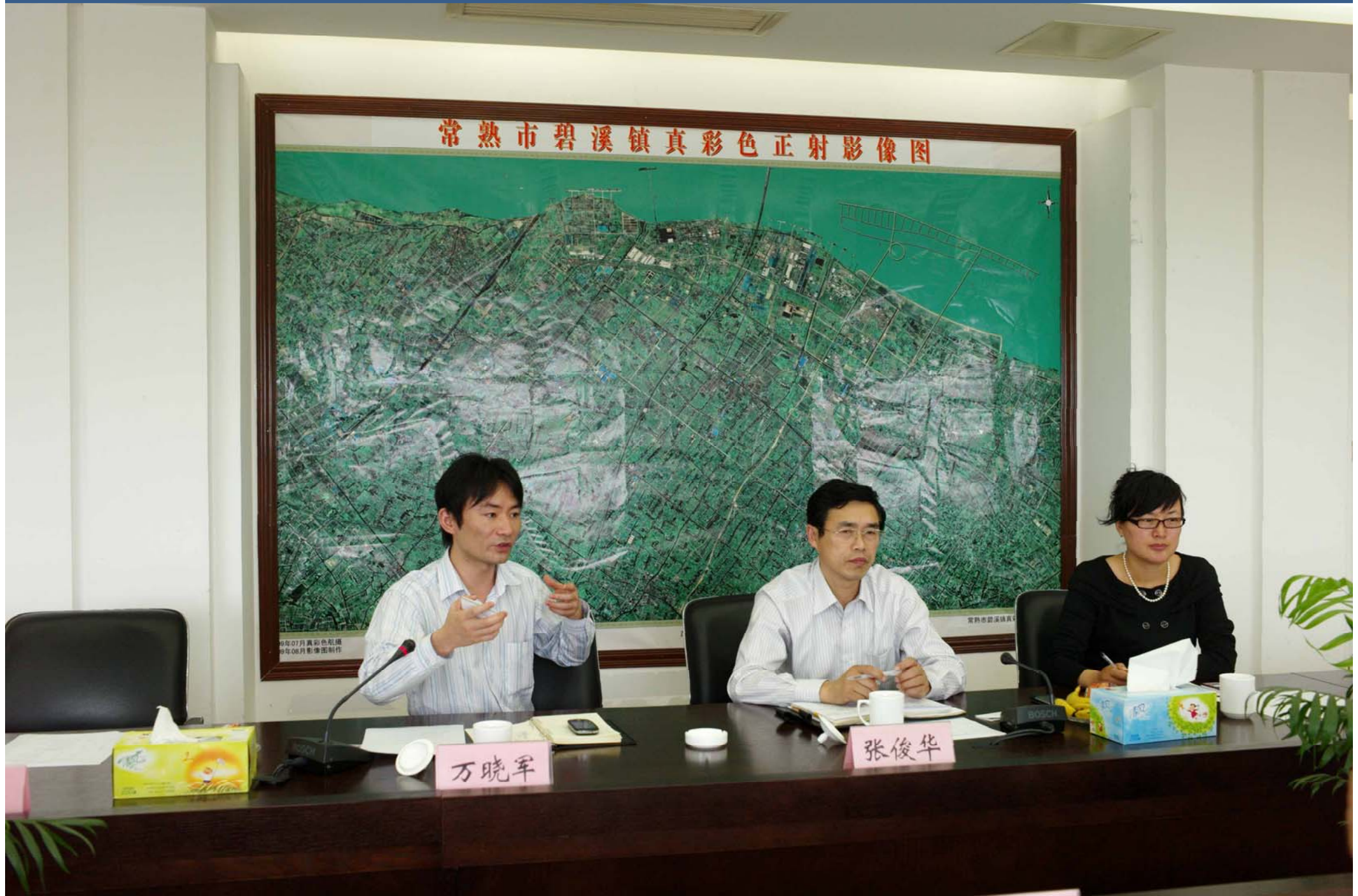


Center for Echo Architecture,
School of Architecture,
Southeast University, Nanjing

PhD-course in Industrial Ecology in China every year



Development of strategic sustainability plan for Bixi Town, Jiangsu province



During 2008 KTH carried out a Research Assessment Exercise (RAE) of all research using an international panel of renowned researchers.

In this evaluation the Department of Industrial Ecology got one of the highest scores of the whole KTH (23 out of 25).



FOCUSING ON
QUALITY



INTERNATIONAL RESEARCH ASSESSMENT EXERCISE 2008
PROJECT REPORT

The Department's vision is:

- In our teaching and research to increasingly integrate technology, ecology, economics and social aspects of the conditions for sustainable societies.
- To deepen the cooperation in research and teaching with industry, cities, municipalities and other research groups in Sweden and internationally.

Stockholm Royal Seaport –

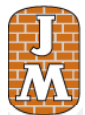
A world class sustainable city, with a Smart Grid as the enabler

Objectives

- 2030: fossil free
- 2020: CO₂ < 1.5 ton/capita
Sweden 5 ton/capita →
China 6 ton/capita →
USA 20 ton/capita →
- 10 000 apartments and
30 000 office places



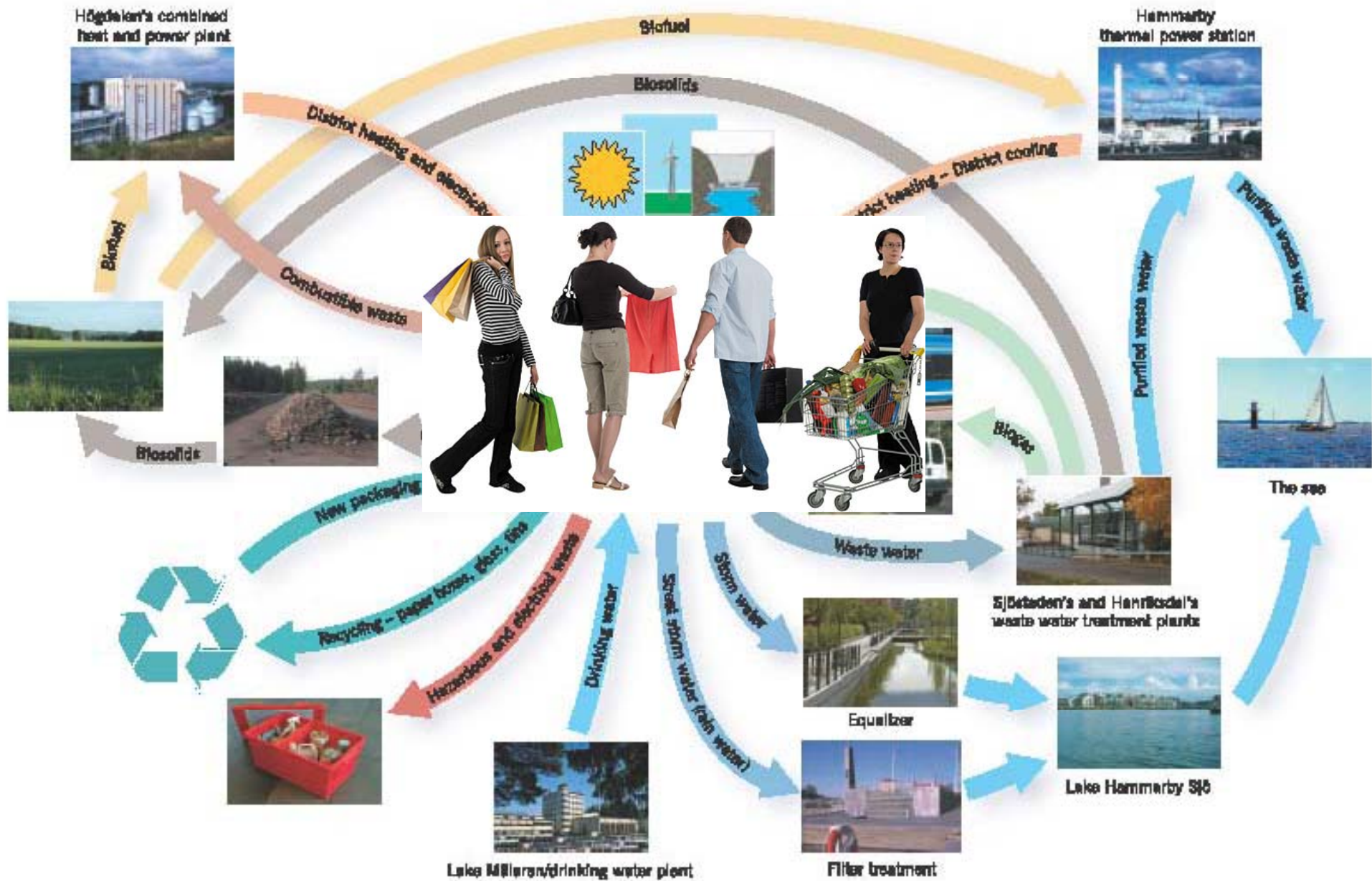
INTERACTIVE INSTITUTE



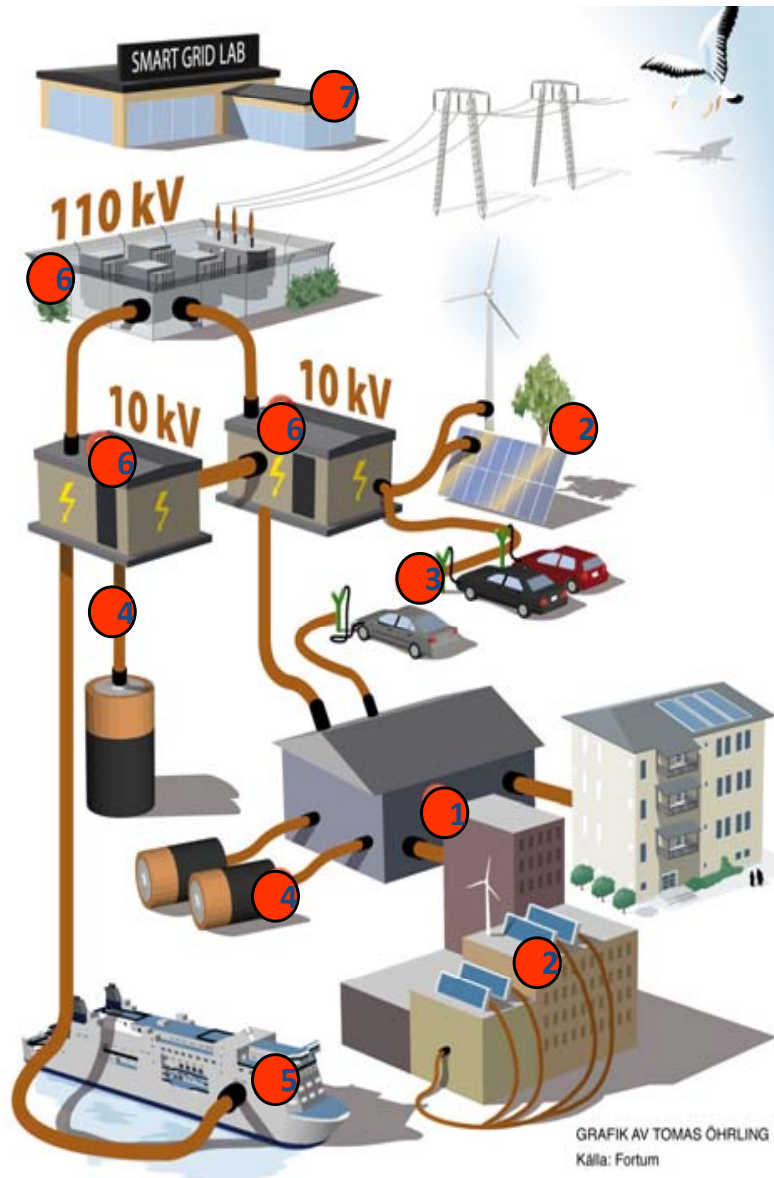
URBAN CHALLENGES
SUSTAINABLE SOLUTIONS
EUROCITIES 2009
STOCKHOLM 25-28 NOVEMBER



Sustainable use of materials and energy in cities



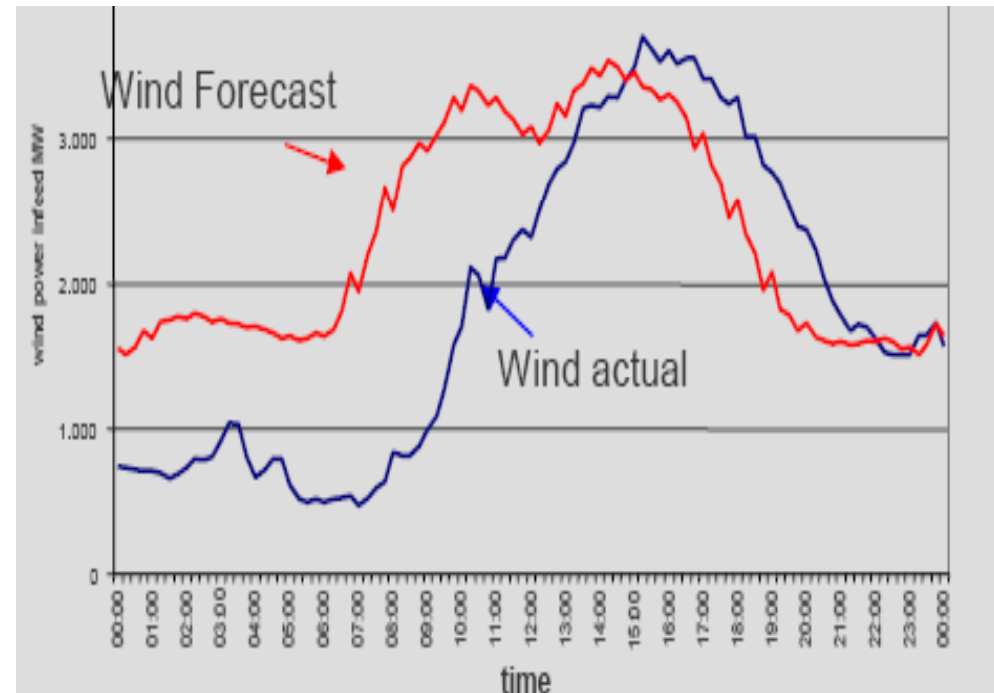
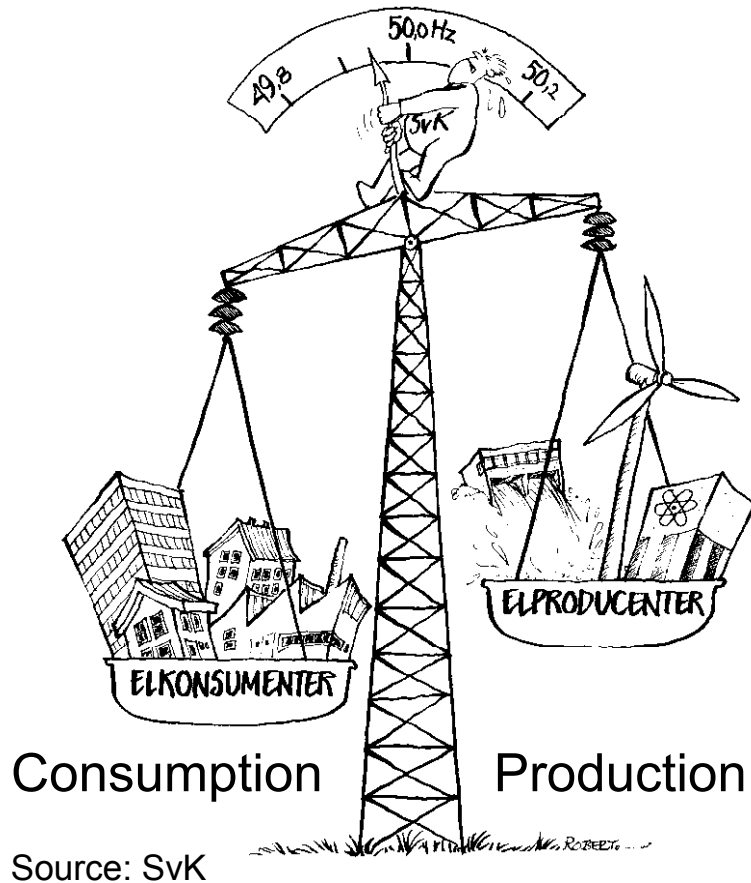
Research and development of a large scale Smart Grid in Stockholm Royal Seaport



- 1 **Smart homes/Buildings and Demand Response**
 - Reduced peak load and increased energy efficiency by demand side participation and home/building automation
- 2 **Distributed Energy Systems**
 - Integration of production for local generation PV and Wind in Home/Building Automation Solution
- 3 **Integration and Use of electric vehicles**
 - Integration of PHEV Charging Infrastructure
- 4 **Energy Storage for Network Support and DES**
 - Increased stability and power quality
- 5 **Harbor Control Solution**
 - Reduced CO2 emission based High voltage shore connection
- 6 **Smart Primary Substations**
 - Increased efficiency and reliability with higher automation level
- 7 **Smart Grid Lab (part of Royal Seaport Lab)**
 - Research, development, simulation and implementation of smart grid application

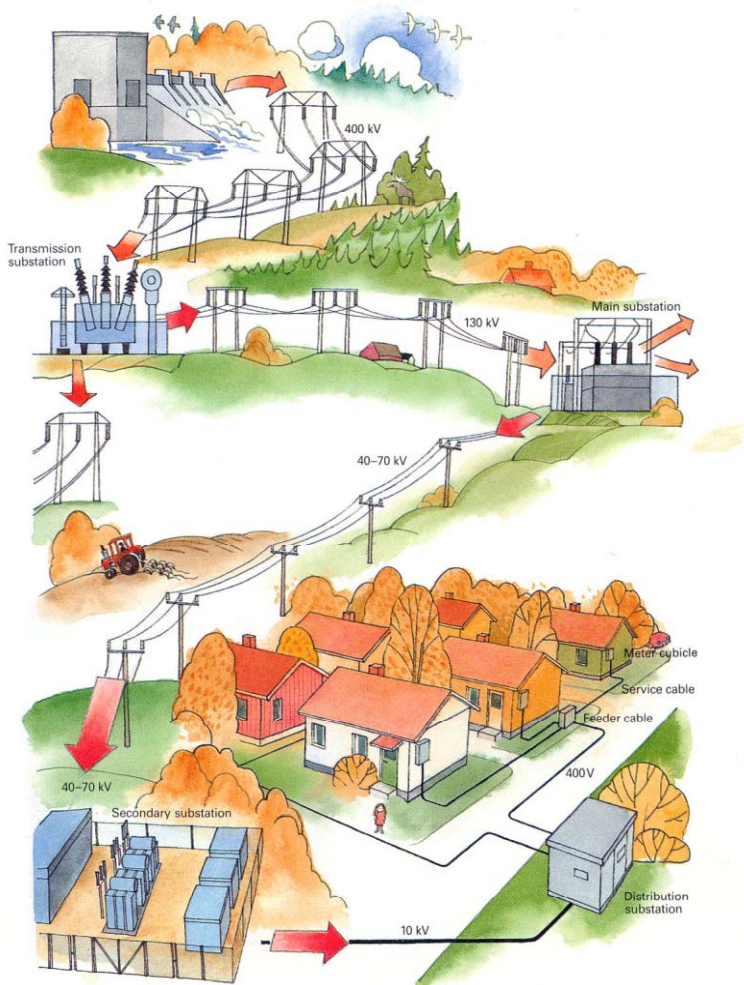
Integration of renewable energy sources

Challenge: Availability of emission free balance power



Wind and Solar requires more balance power

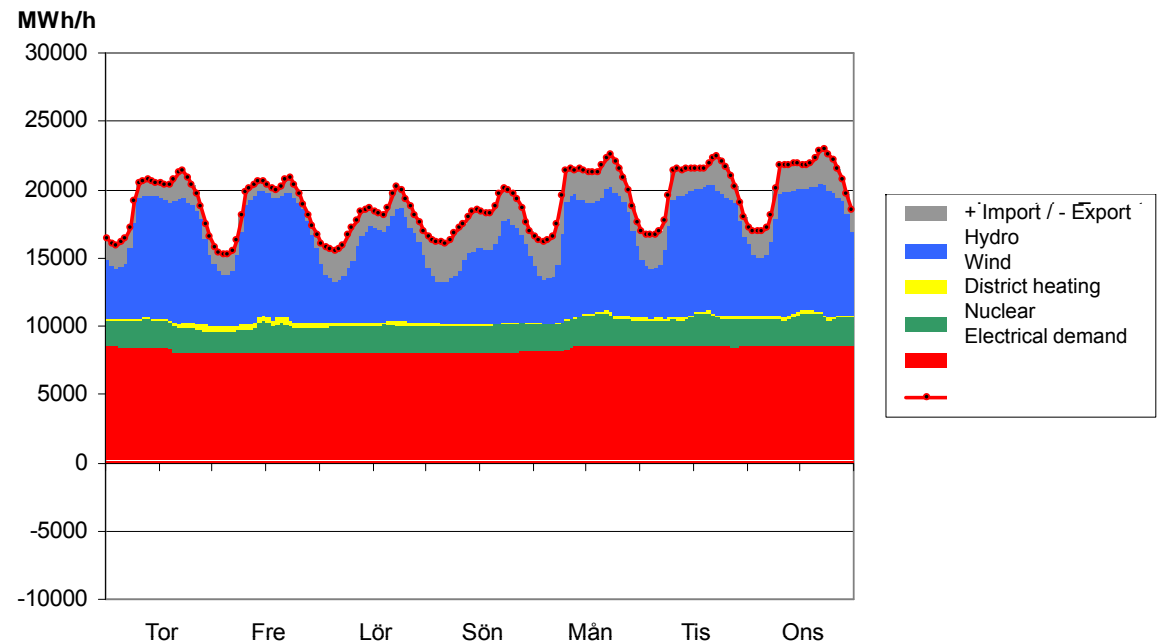
Smart Grid enables balance by interconnected networks and integrated active consumers



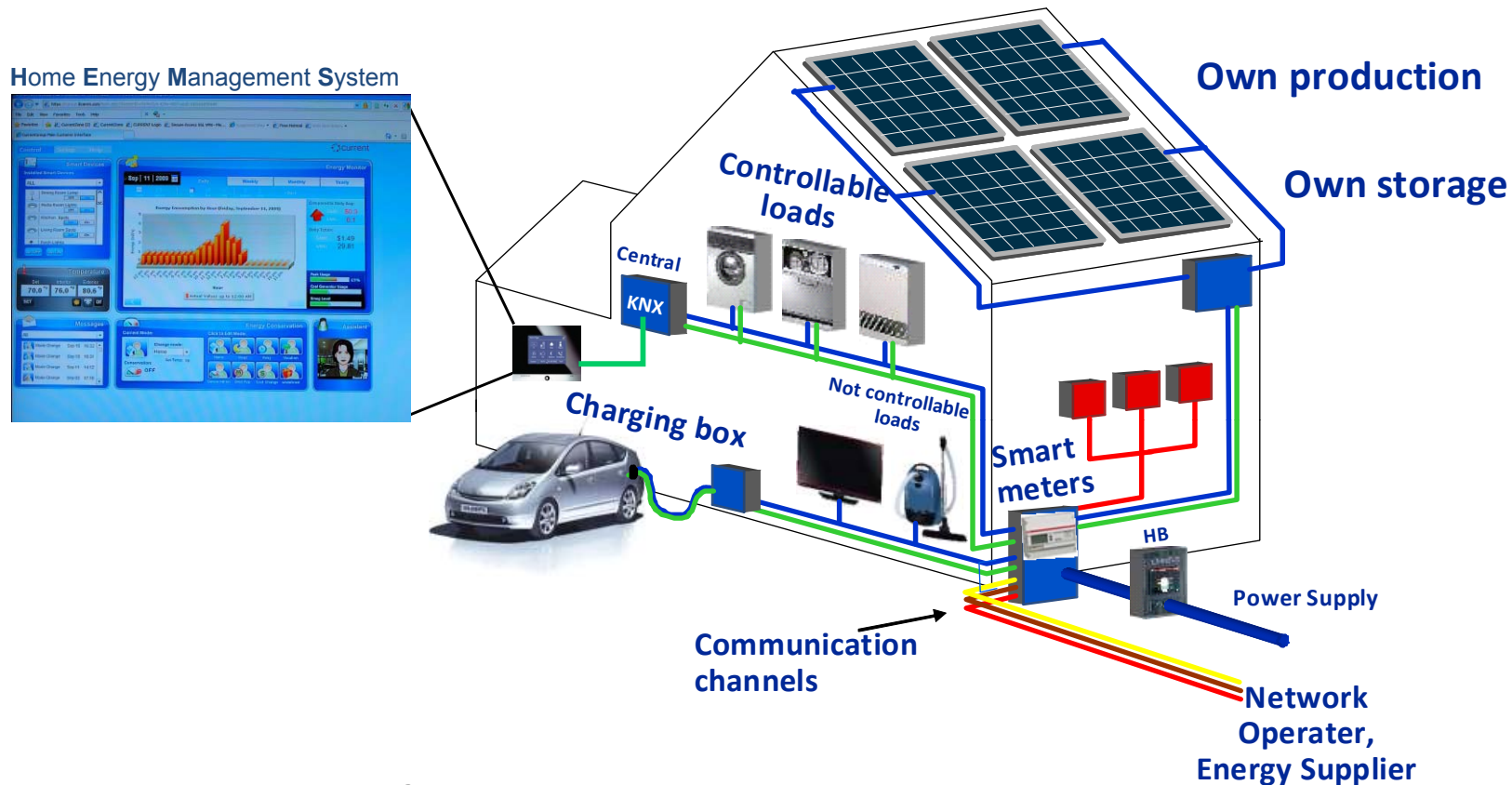
Planning targets for Sweden

Wind	30 TWh, 15 000 MW	Compare
with		
Hydro	16 000 MW	
Nuclear	9 000 MW	

How to balance intermittent 15 000 MW wind?
Balance control from production and/or consumption side



Smart Grid components: Integrated Active House and Electric Vehicle

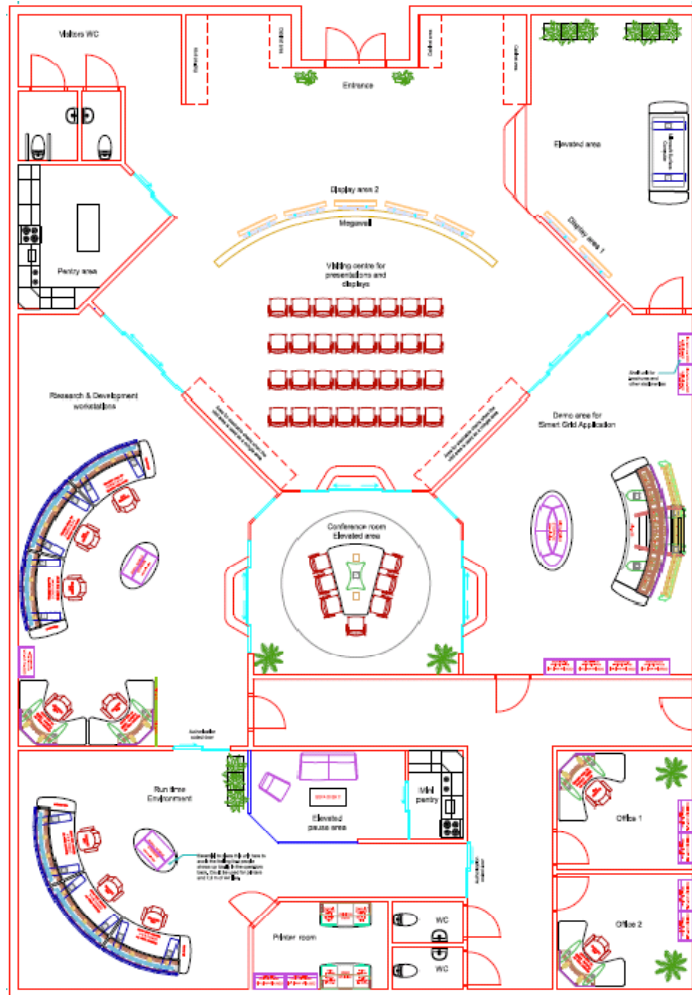
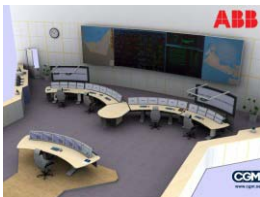
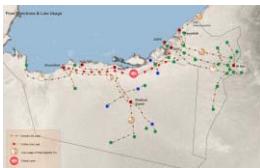
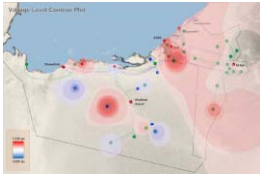


Benefits

- Active 'prosumer' benefits from most favorable spot price
- Peak load shaving by local production, storage and time shift of consumption
- Overall reduction of energy consumption by increased consumer awareness

Royal Seaport Lab and Test Bench

Draft, Arena for project



- Visitors Centre
 - Arena for Area presentations and education. 10-30 people in standing/sitting arrangement
 - Self instructed Royal Seaport display with touch screen monitor.
 - Microsoft Surface technology for presentation in small groups (6-8 people)
- R&D Centre
 - Extended workplace with large personal large screen for increase situational awareness
- Smart Grid Control Centre
 - Workplace with 3 work stations for execution and follow-up of full scale test scenario

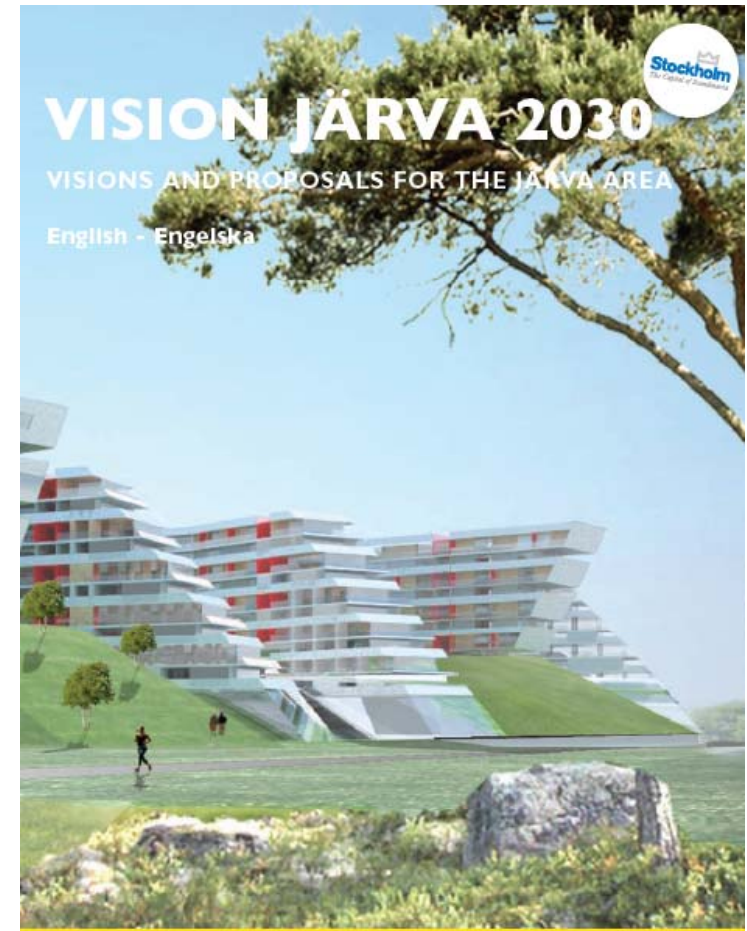
Sustainability up-grading of old suburban areas

Participation of residents and the cooperation of other stakeholders, to generate social and economic development.

Järvafältet should also be an engine for growth throughout Stockholm.

To achieve this, we need to work actively in four main areas:




- Good housing and a more varied urban environment
- Everyday safety and security
- Improved education and language teaching
- More jobs and enterprise



Zero emission community in Denmark

LANGUAGE **DK** DE EN MASTERPLAN | NYHEDSBREVE | BLOGS | PROJEKTER | TEMAER | PRESSE | OM PROJECTZERO | SØG:

FORSIDE BORGER VIRKSOMHED KOMMUNE LÆRING VEJEN MOD NULLET GO ZERO



Bright Green Business
ProjectZero

ProjectZero er visionen om at gøre hele Sønderborg-området CO2-neutral i 2029. En bred vifte af banebrydende initiativer blandt områdets virksomheder, institutioner, uddannelsessteder og borgere skal føre os frem til vejen mod nullet.


NYHEDER KONKURRENCER

- 17.11.2010 Nyt kursusforløb i klimaledelse
- 17.11.2010 Folkeuniversitetet startede en ny tradition
- 17.11.2010 Sønderborg er fremtidens CO2-neutrale vækstområde
- 17.11.2010 Sønderborg er på den internationale energidagsord...
- 17.11.2010 Houston - we have a problem!
- 16.11.2010 Lasse rykker fra F til B
- 14.11.2010 Et Grønt Pentagon
- 14.11.2010 Sønderborgs borgere har fokus på klimaet

PROJECTZERO KALENDER

- 15.11.10 Cleantech iværksættere efterlyses
- 18.11.10 Informations- og indkøbsmesse i Gråsten
- 25.01.11 Kursus i klimaledelse
- 22.02.11 Kursus i klimaledelse
- 15.03.11 Kursus i klimaledelse
- 26.03.11 Earth Hour 2011


ZEROBOLIG



I samarbejde med en række partnere, lancerer ProjectZero nu ZERObolig konceptet, hvor Sønderborg-områdets boligejere inviteres til at bo billigere, bedre og mere klimaklogt.

[LÆS MERE OM ZEROBOLIG KONCEPTET HER](#)

VARMEPUMPER DEN FREMTIDSSIKRE LØSNING



Varmpumper er den mest økonomiske og miljømæssige løsning ved udskiftning af olietyret.

[LÆS MERE HER](#)

European Institute of Technology (EIT)

EITs mission is to enhance and utilize the innovative capacity and skills of stakeholders in higher education, research, business and entrepreneurship in Europe and beyond by creating integrated Knowledge and Innovation Communities (KICS).

KTH is main partner in two KICS



EIT ICT Labs will use ICT as the key enabler driving the transformation towards the Future Information and Communication Society. We aim to generate individual satisfaction as well as sustained economic growth and social benefits throughout Europe.



InnoEnergy pursues an independent and sustainable energy system that makes Europe climate neutral by 2050 by successfully commercialize innovations such as new products, services and business ideas.

InnoEnergy partners



KIC InnoEnergy - Committed to change the European energy system through innovation

WHY?

Challenge of sustainable and low carbon energy supply
Closing the innovation gap in Europe

WHO?

World class alliance of top European players with a proven track record

WHAT?

Whole energy-mix solution coherent with SET Plan
Practical approach to integrate the knowledge triangle

HOW?

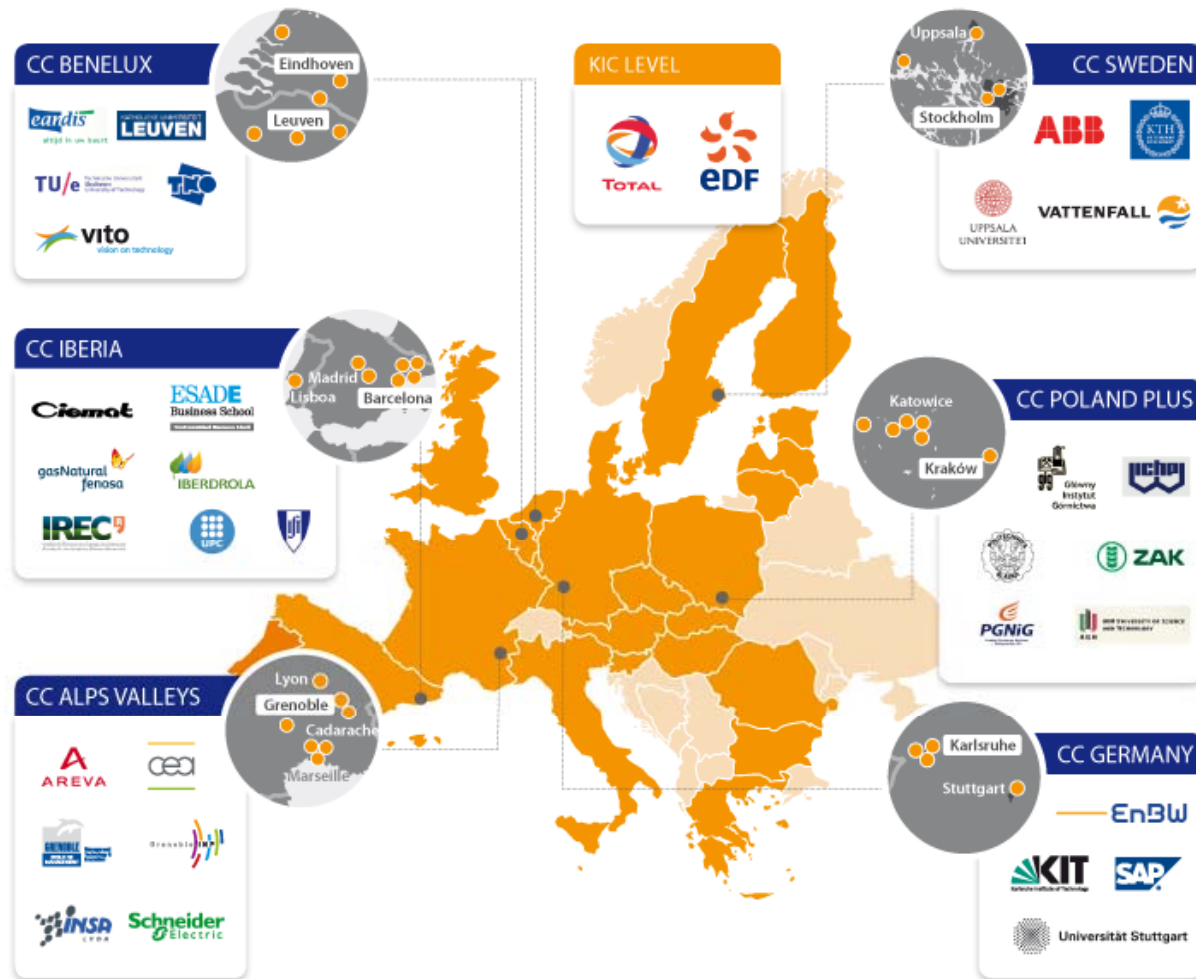
Business-like organization

- Lean and effective governance structure
- Sound and monitored business plan with specified goals (KPIs)

WHEN?

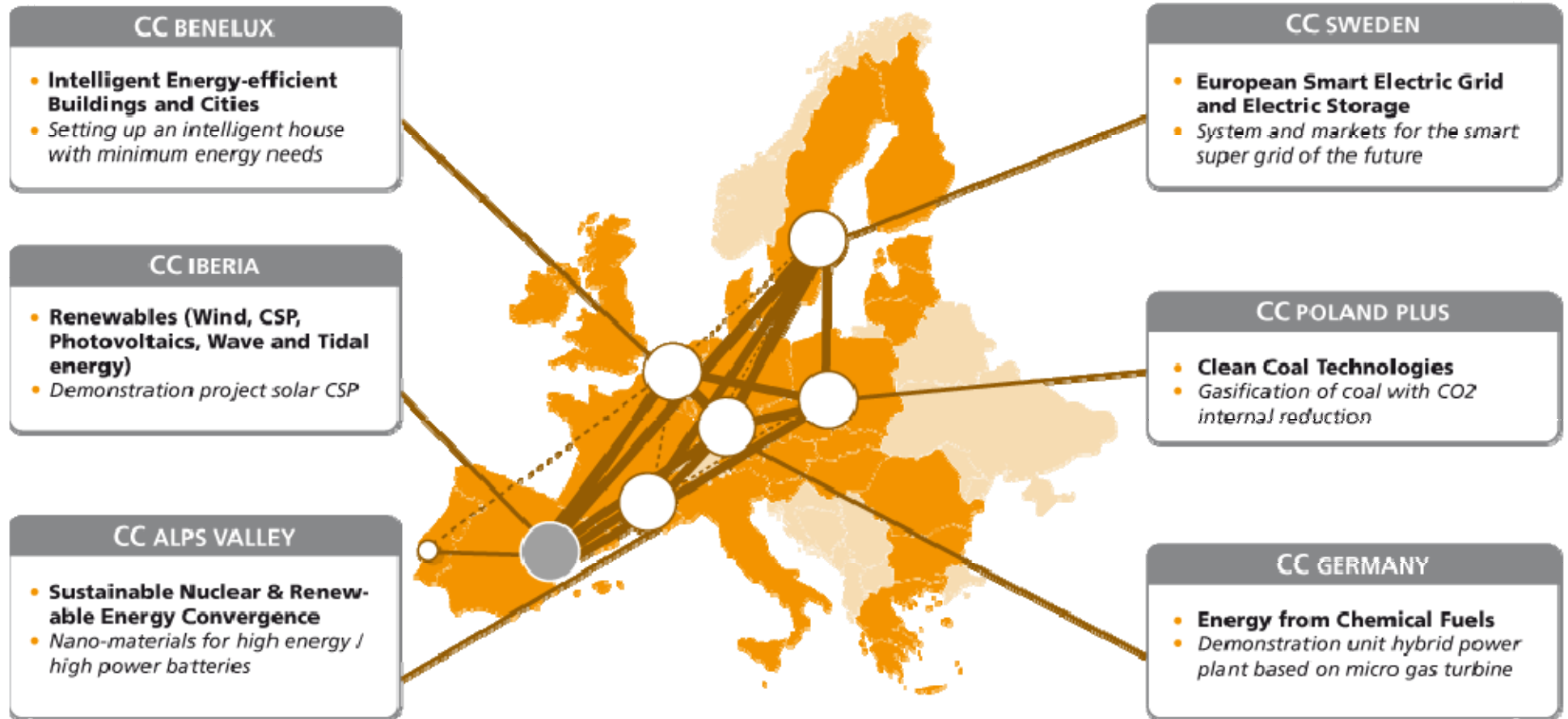
Staffing already started – CEO on board
Hands-on implementation plan for 2010

KIC InnoEnergy – A world class alliance of top European players with a proven track record



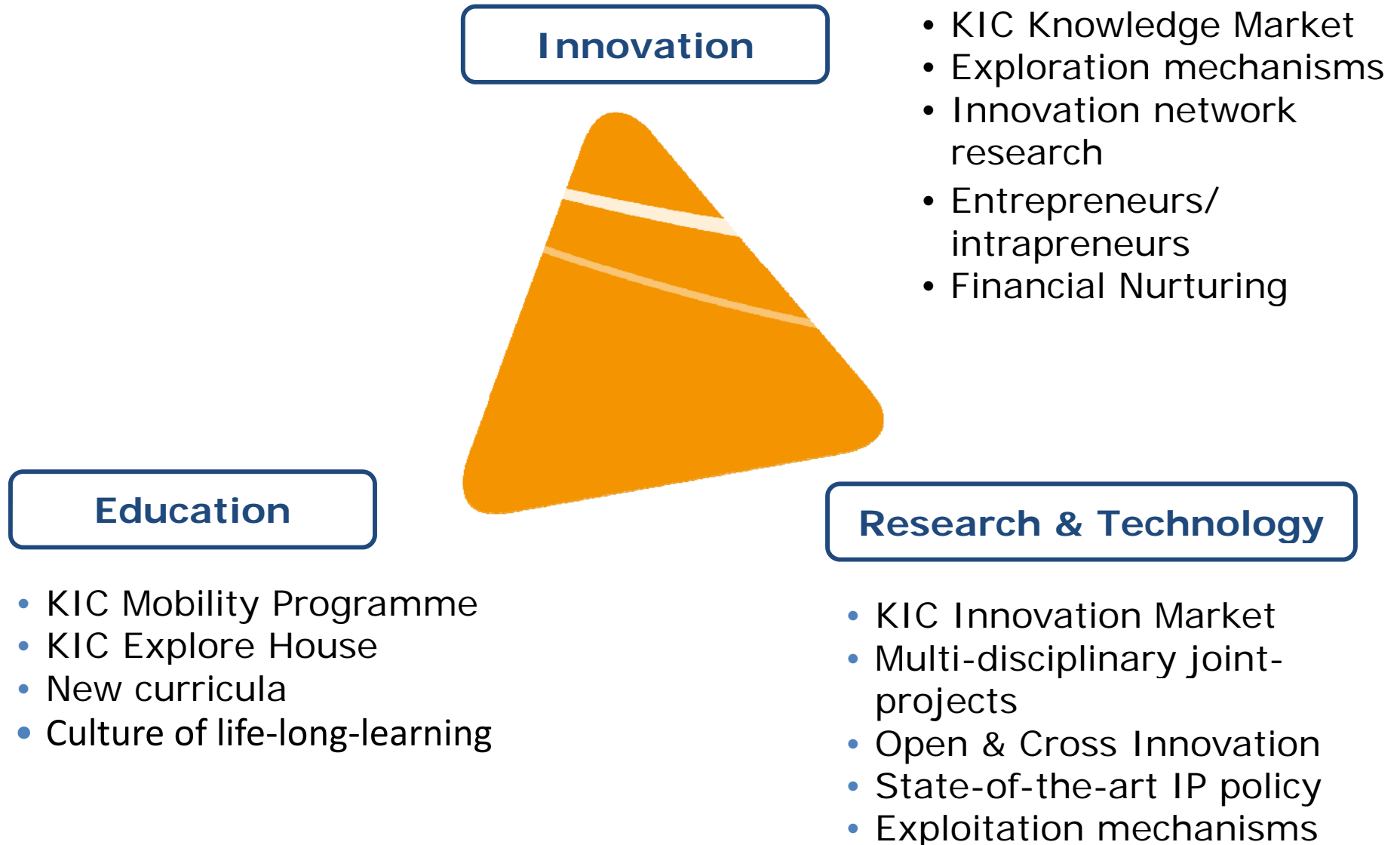
- 13 companies, 10 research institutes and 13 universities
- Approximately 50 % industry partners (incl. associated partners)
- More than 50% of key research players in Europe
- Covering the whole energy spectrum
- Knowledge triangle balanced along all dimensions
- Strong connection with VCs and local governments

KIC InnoEnergy will bring innovation to the whole energy-mix coherent with the SET Plan

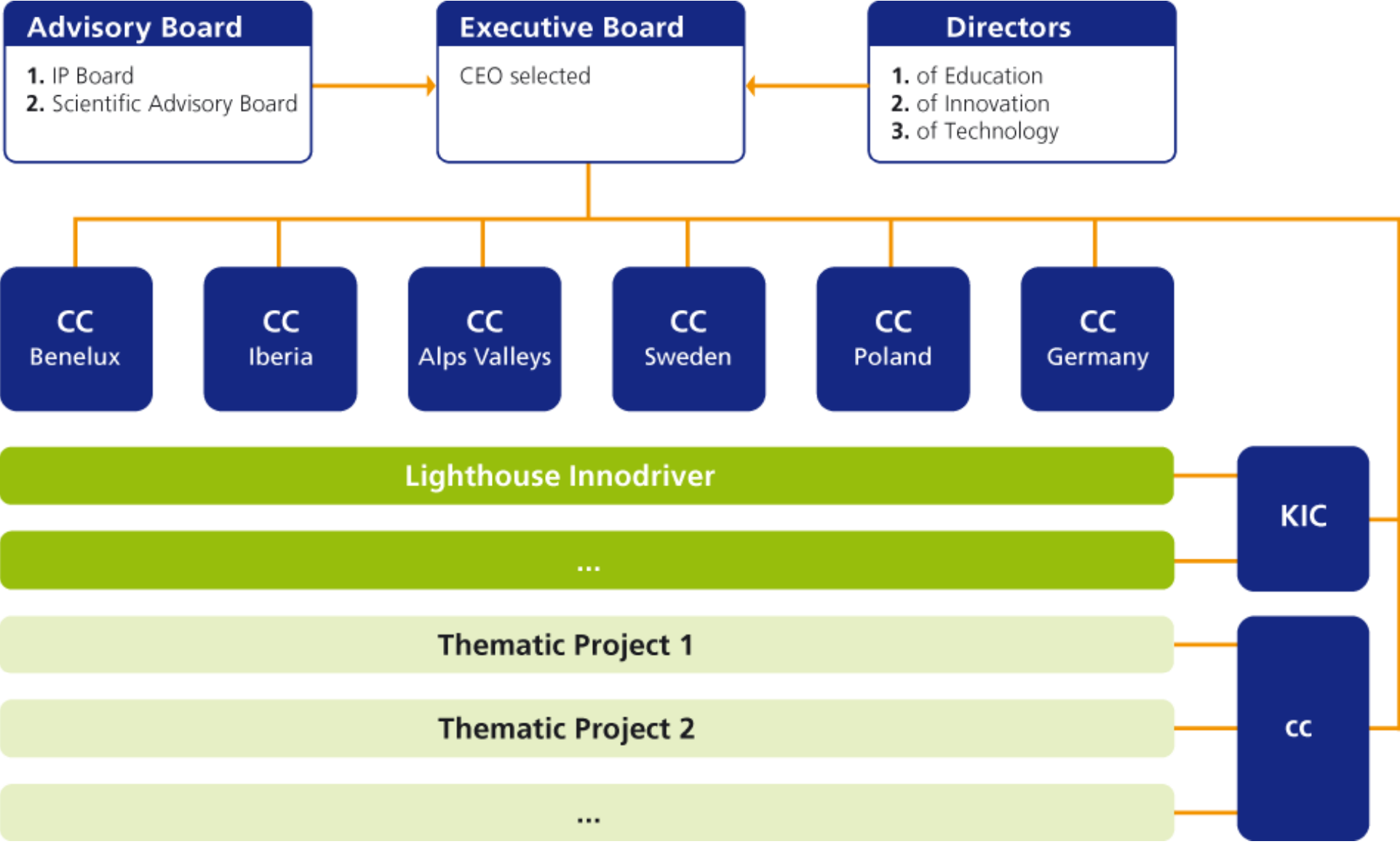


Integration of the knowledge triangle

Our practical approach will boost innovation in Europe



KIC InnoEnergy - Run like a business through a flexible and effective organizational structure



What will happen in EU Framework Programme?

European Commission
CORDIS

European Commission > CORDIS > FP7

Home News Funding Results Themes Go local Look it up Interact Help

Seventh Framework Programme (FP7)

Search all CORDIS content

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- Understand FP7
- Participate in FP7
- Find a call
- Register your organisation
- Preparation and Submission of Proposals (EPSS)
- Get support
- Find project partners
- Find a project
- Find a document

Cooperation

Ideas

People

Capacities

Euratom

JRC

Latest News

FP calls will need bigger consortia and more integrated knowledge and partnerships

ENV.2011.2.1.5-1 Sustainable and Resilient Green Cities

Urban resilience relates to a city's ability to respond to a number of combined "**grand challenges**": natural resource shortage ("peak oil", water, etc.), climate change adaptation and mitigation, and unprecedented urban growth; in ways that are socially, economically and environmentally acceptable and feasible.

Thanks!