

Learning for Collaborative Energy Efficiency in Urban Residential Areas, ClueE

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REAL WORLD PROBLEM

Why is energy efficiency progressing so slowly in Swedish multi-family housings?

PROJECT AIM

To pin-point and analyse barriers and conveners for energy efficient retrofit in municipal multi-storey houses (built in 1960's and 1970's) in Western Sweden → and to suggest an energy transition strategy for Swedish municipalities

ClueW 2011 – 2012

Funded by: The Swedish Energy Agency,
The Swedish Research Council, FORMAS,
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Social sciences research methods

- Real-life and critical cases generate development of analytical perspectives and recommendations (Flyvbjerg *Making Social Science Matter* 2001, and *Real Social Science* 2012)
- Adaptive Management = policy perspective is a blind spot
Transition Management = policy perspective is limited (Voß et al 2011)
- ClueE aims at contributing with an analysis of barriers impeding on policy implementation at micro, meso and macro levels of political governance
- ClueE applies several methodological approaches;
 - small-scale surveys
 - stakeholder-analysis
 - interviews
 - document and text analysis
 - financial analyses
 - judicial analysis of legal circumstances, and,
 - technical analyses of the state of the art of buildings

ClueE's additional objective is to make a tentative strategy for municipalities to spur implementaion of energy efficiency measures in their houses.

Conflicting goals in the debate:



- "We have the technique – but we progress only slowly ..."
 - The National Energy Agency
 - SP, technological consultants
 - Energy researchers, Chalmers Energy Center
- **Conflicting goals:**
 - National versus local level
 - Environmental policy versus economic political goals
 - Traditional versus new social practices/innovative behaviour
 - Municipal responsibility for services versus emission reductions
 - Making a profit on energy sales versus energy savings
- "Reducing the energy need by half in the 'million programme areas' is possible. According the Swedish public housing property owners association, SABO, such a wide-ranging efficiency is not profitable for the estate owners
 - Split incentives at the micro level

Brogården Housing area

Knektegårdsgatan 37 (House D)	Before restoration	After restoration
Rentable area 1 337 sqm	[kWh/m ² /year]	[kWh/m ² /year]
Heating	115	19
Hot water	42	18
Household electricity	39	28
Residential electricity	20	21
Total energy consumption	216	86
Excl. household electricity	177	58

Orrholmen, Karlstad, built in 1960 (250 → 150 kWh/m²/år)



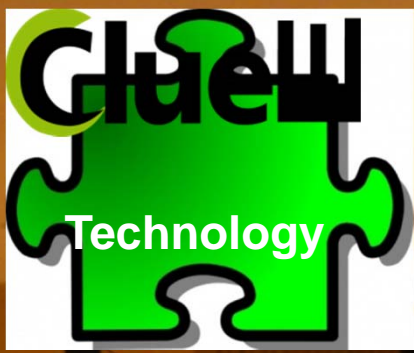
Other Swedish examples of energy efficient buildings



Konstnärsgillet, Bredäng, built 1964, (128 → 64 kWh/m²/yr)

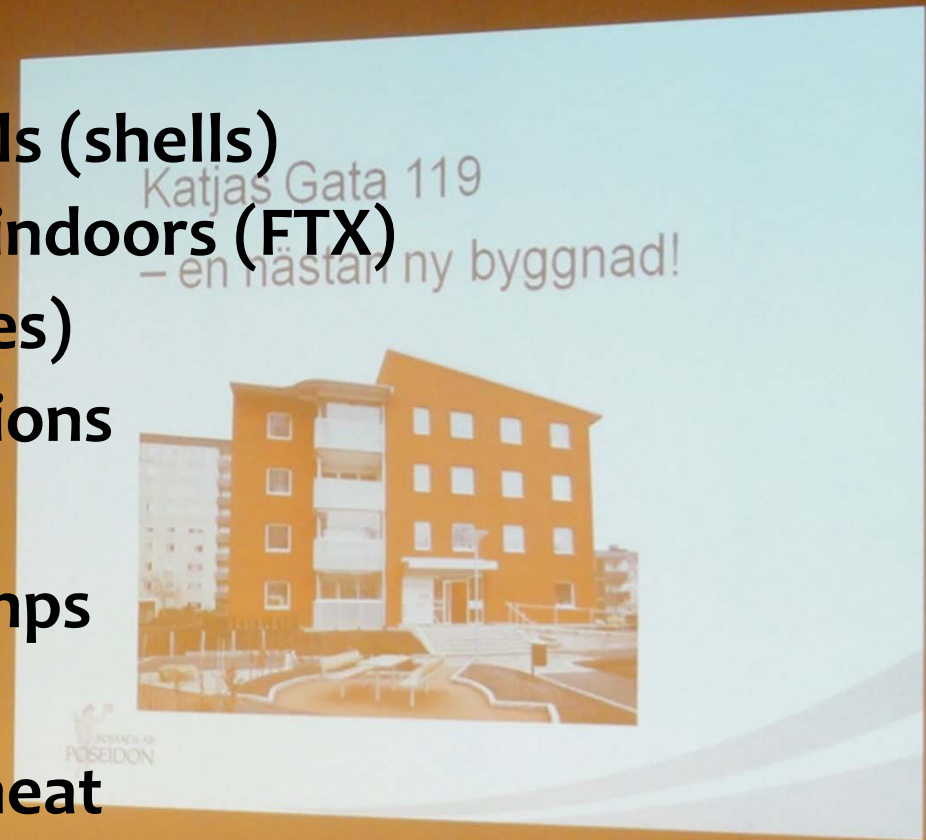
Harbour House, Gothenburg, built 2008, (55 kWh/m²/år)

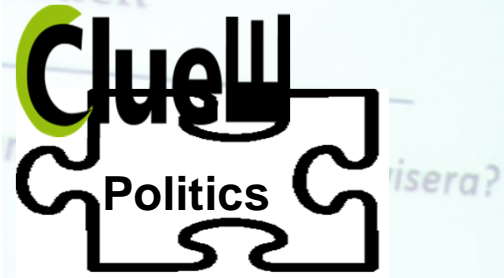




Technical measures for energy savings

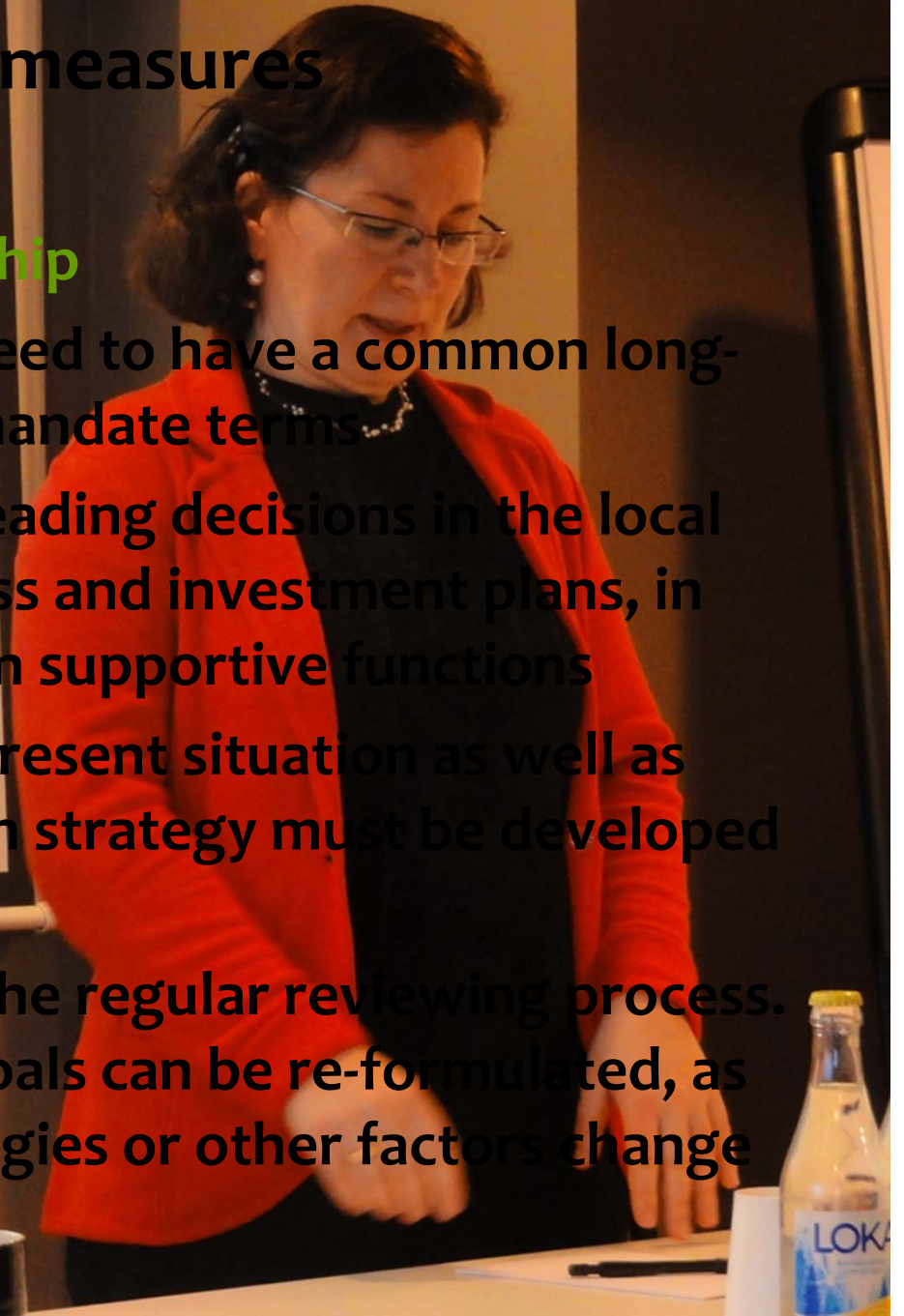
- Supportive insulation of walls (shells)
- Complementary ventilation indoors (FTX)
- Change of windows (3-glasses)
- Reviewing the heating solutions
- Pipe insulations
- Energy efficient heating pumps
- Adapting water usage
- Recycling of sewage water heat
- Reviewing of lighting solutions in apartments/ common spaces





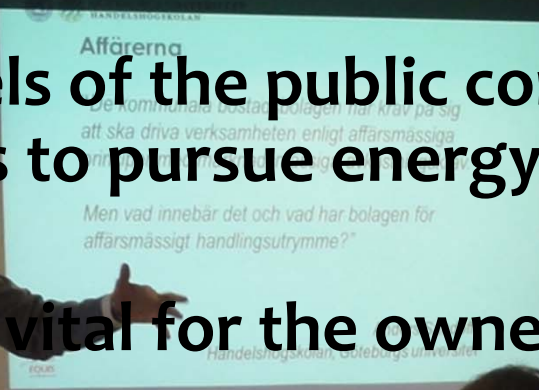
Political steering measures

- **NUMBER ONE: Clear political leadership**
- Larger parties in local government need to have a common long-term vision that stretches over the mandate terms
- This vision must be mirrored in the leading decisions in the local government; in the budgetary process and investment plans, in the local (housing) companies, and, in supportive functions
- An energy vision should reflect the present situation as well as partial goals, a local energy transition strategy must be developed for each and every municipality
- The locally set targets should guide the regular reviewing process. Based on such assessments partial goals can be re-formulated, as local circumstances, known technologies or other factors change



Business models for energy efficiency in public houses

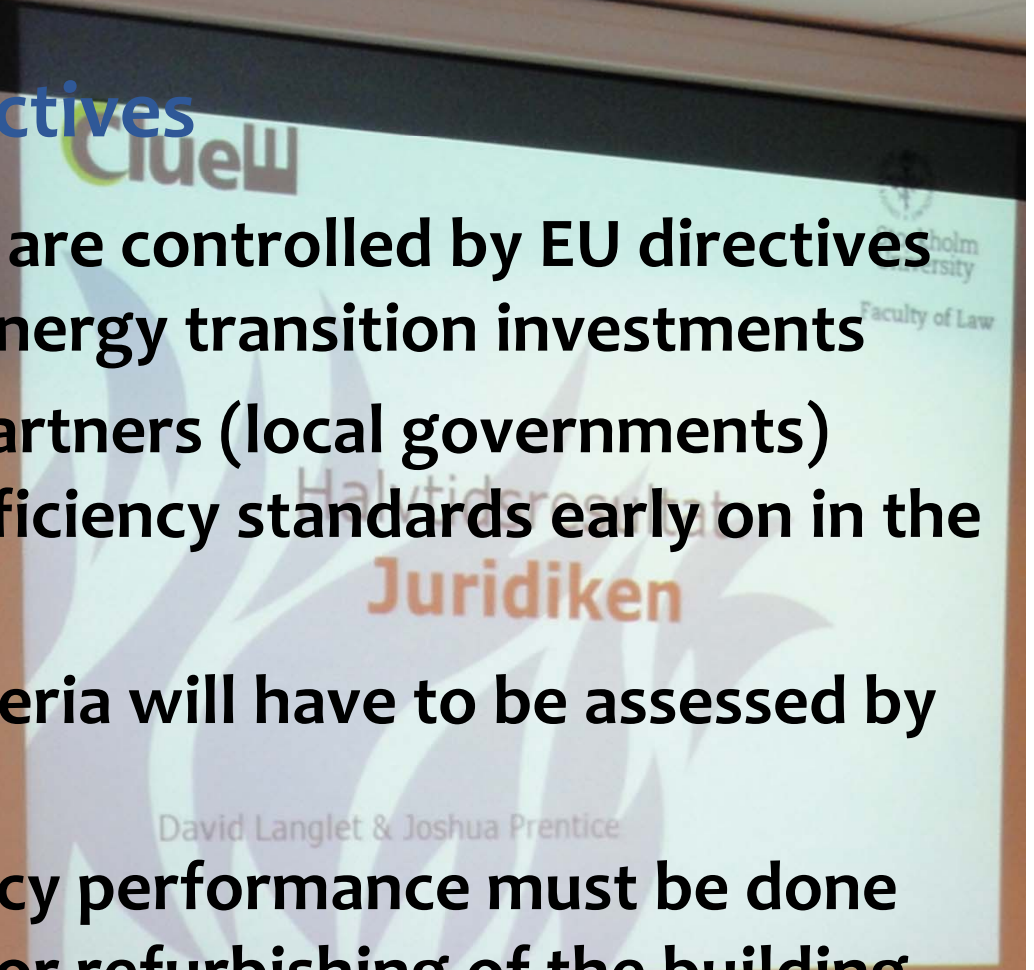
- The business models of the public companies are crucial for the possibilities to pursue energy efficiency measures in their buildings
- Political support is vital for the ownership directives
- If energy efficiency initiatives becomes profitable or not depend on how the single company relates to the larger basket of local government business activities
- There is a potential for 'branding' for the entire municipality in relation to energy efficient activities (show-cases, technology innovation, scalability, knowledge transfer, living labs, transition)
- Down-side? ... Local transition plans must internalise risk management and hidden costs





EU directives

- Public procurement procedures are controlled by EU directives and can be actively pursued in energy transition investments
- It is important that purchasing partners (local governments) define the criteria for energy efficiency standards early on in the bidding process
- Control of energy efficiency criteria will have to be assessed by independent personnel
- Following-up on energy efficiency performance must be done after finishing the construction or refurbishing of the building
- In order to assure high quality a dialogue among the partners throughout the entire building process is required. Partnering may be an alternative but, this is yet not enough developed or researched (as it may involve *risk taking* such as higher costs)





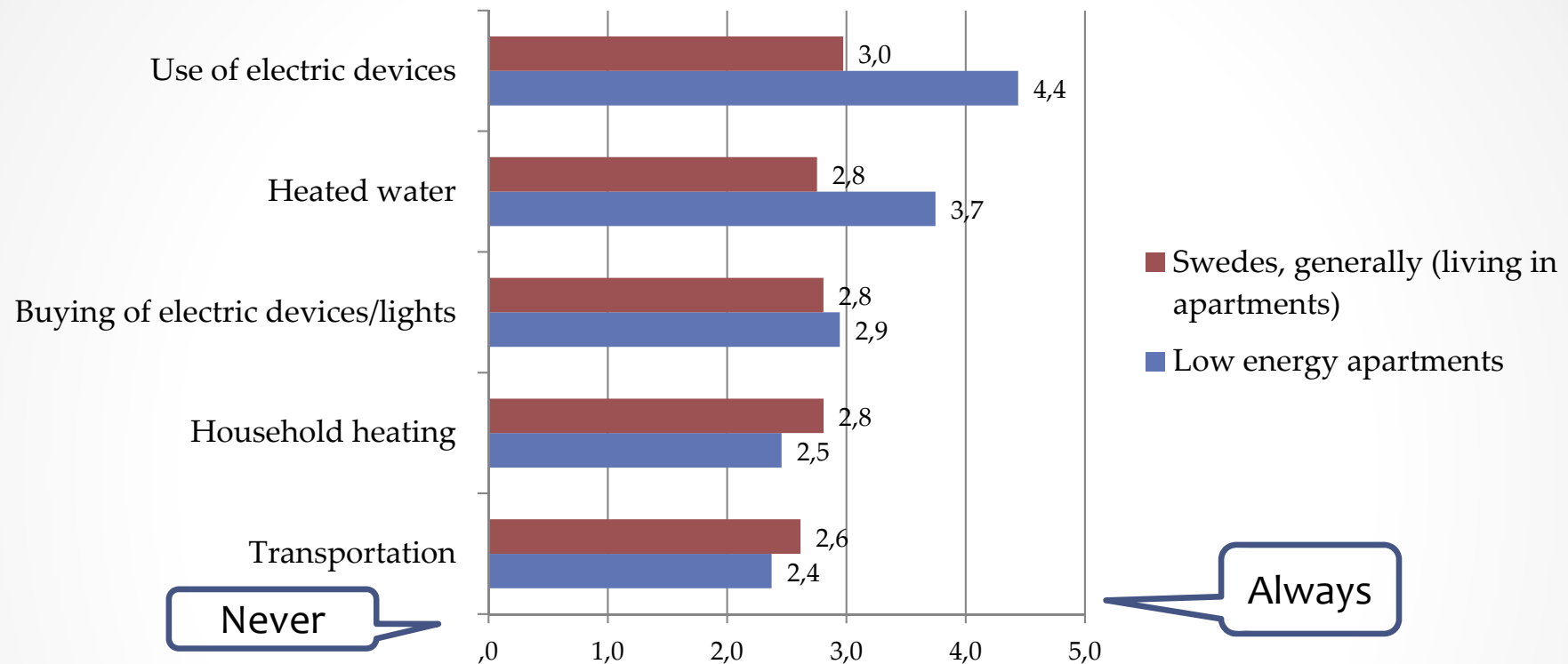
Users behaviour and attitudes

Marie Thynell, FD
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- At the household level good communication between tenants and owners is crucial to facilitate energy savings or efficiency
- So called 'Green metering' for measuring use of hot water or electricity is a contested method. Two conflicting interests prevail:
 - build well isolated or passive houses making behavioural changes redundant, and,
 - residents require support systems, suitable technique and this will have to be managed. The cost of the necessary support reduces the savings but perhaps increase awareness about energy as a resource
- Tenants who are interested in energy efficient behaviour evaluate the whole living concept as 'green living' and become disappointed whenever the 'package does not connect' well (recycling possibilities, choice of materials, ability to live without a car and so on)
- The tenants are not always interested in energy efficient savings methods

”How often do you try to use less energy?”



Källa: ClueE 2012 och Riks-SOM 2011. Only Swedes living in apartments participate in the survey

Findings: What people say and what they do is often not the same thing. Our results shows that tenants in low energy apartments are in general good at reducing their use of energy when it comes to electric devices, use of heated water, and purchase of lights bulbs/electric devices. But when it comes to heating they are less good than the average family living in apartments in Sweden. More than 40 percent of the informants do not have a car and that is why they cannot use less energy when travelling.

A general conclusion is that adults living in low energy housings do not have more concerns about the natural environment than the average Swede have.

But their behaviour is more environmentally sound.

Perhaps this is due to economic shortcomings and e. g. the fact that they cannot afford to go by car or, because they live in a house that foster or is supportive of a green lifestyle.

Energy Transition Structure: Municipal level

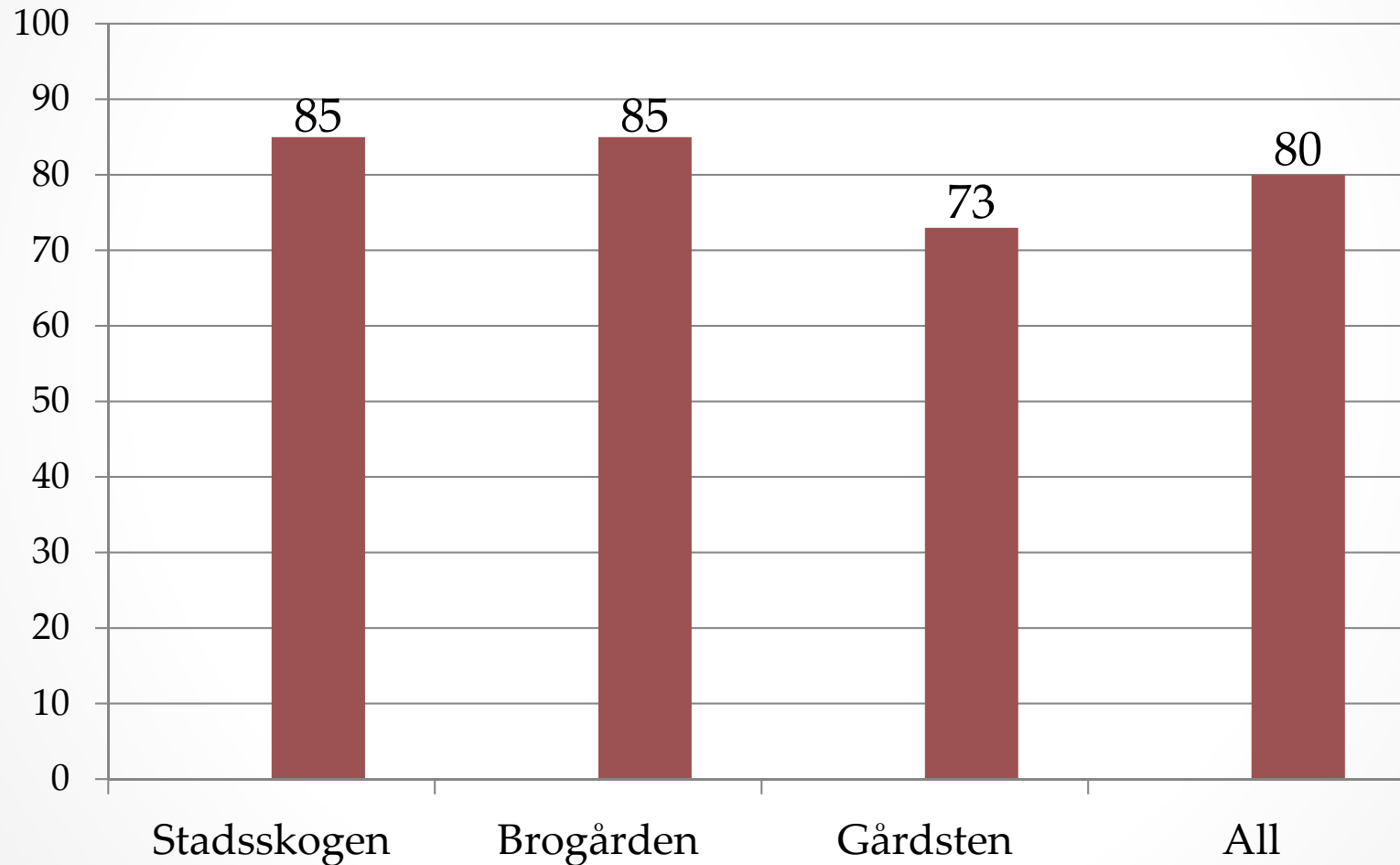
Energy	Systems supplies municipalities with energy for heating, cooling, electricity etc.	Systembuilding and maintenance competencies
<p>Stakeholders and possible transition tools</p>	<ul style="list-style-type: none"> • Legal regulations from EU and national level • Energy services are traded on markets • Sprawl over space (large or small municipality), decision spans • Energy companies, estate owners, various interests • Political initiative and decisiveness • Local planning monopoly • Business models, relations to risk/opportunity assessments • Alternative costs and risks • Regular/yearly review on the Local Energy State 	<p>Legal competences Business economists Public procurers Public business boards Owner directives Executive director Politicians Environmental analysts Planners Project leaders Political parties</p>
<p>Actors</p>	<ul style="list-style-type: none"> • Citizens, energy consumers, tenants, business, various markets and innovation interests 	<p>Media and communication Private companies Human resource managers Communication functions Civil society associations</p>

Some lessons learned

It is problematic to increase energy efficiency by relying on "one-size-fits-all-solutions", instead there will have to be locally negotiated strategies to facilitate implementation of different kinds of energy savings and efficiency

- ✓ **Define where you are:** Whenever partial targets are not met a reformulation of incentives needs to be done. Analyses of local energy indicators in housing stocks, present energy use, and continued followings-ups in relation to locally defined targets and risk exposure
- ✓ **Identify your local tools:** Energy policy needs to generate its own political support locally. Policy tools are e.g. political power, local procurement policy, cross – sectorial strategies, energy efficiency measures as part of investment packages, local media involvement, and local tenant/citizen involvement
- ✓ **Effective energy policies requires national support:** Identify and negotiate potential conflicts between :
 - various national energy complexes (don't want to sell less kWh)
 - construction industry – energy efficiency (building prices may rise)
 - think of the producers – as well as end-users (energy leakages)

”How satisfied are you with your housing today?”



Source: ClueE 2012. Share responding *Very* or *Somewhat satisfied*



**”thou shall not make fires for the
crows...”**

(Old Swedish proverb)



MISTRA
**URBAN
FUTURES**



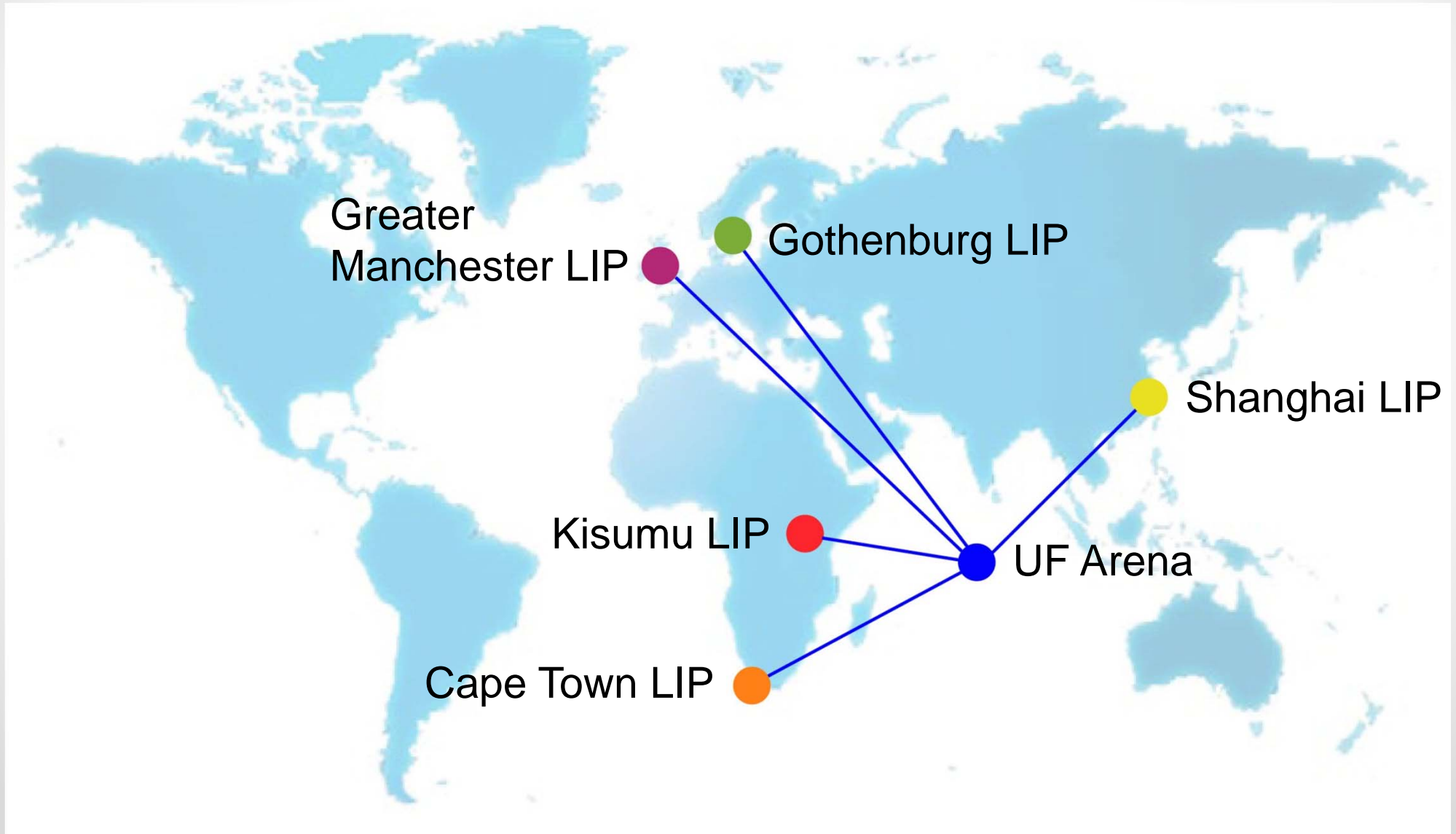


Mistra Urban Futures in short

- A global knowledge and research centre with focus on producing knowledge within **sustainable urban development.**
- Providing policy- and decision-makers with evidence and research for capacity building and a sustainable urban future.
- Headquarters in Gothenburg, Sweden
- Operates locally in:
 - Cape Town, South Africa
 - Gothenburg, Sweden
 - Greater Manchester, United Kingdom
 - Kisumu, Kenya
 - Shanghai, China



Global meets local

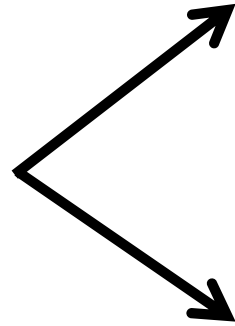




Challenges

Complexity:

Trans-sectoral
Multiple scales
Uncertainties & risks
Discursive mismatches
Incommensurable goals



Substantive:

Fair Green Dense dynamics
System limits & thresholds
Local–global interdependencies
Regenerative sustainability

Procedural:

Diversity of actors
Institutional structures
Power discrepancies
Transformative capacity



Thank you

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