IEA-EBC Annex 63

Implementation of Energy Strategies in Communities”

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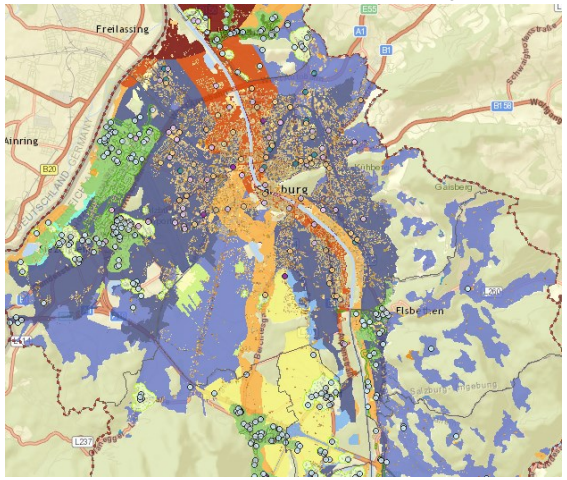
SIR – Salzburg Institute for Regional Planning and Housing

- Working in the fields of
  - Spatial planning and regional development
  - Housing
  - Energy&climate protection
- by offering activities of
  - Service/Consultancy
  - Research/Pilot projects/Programs
  - Publication, Education/Training

Some Projects

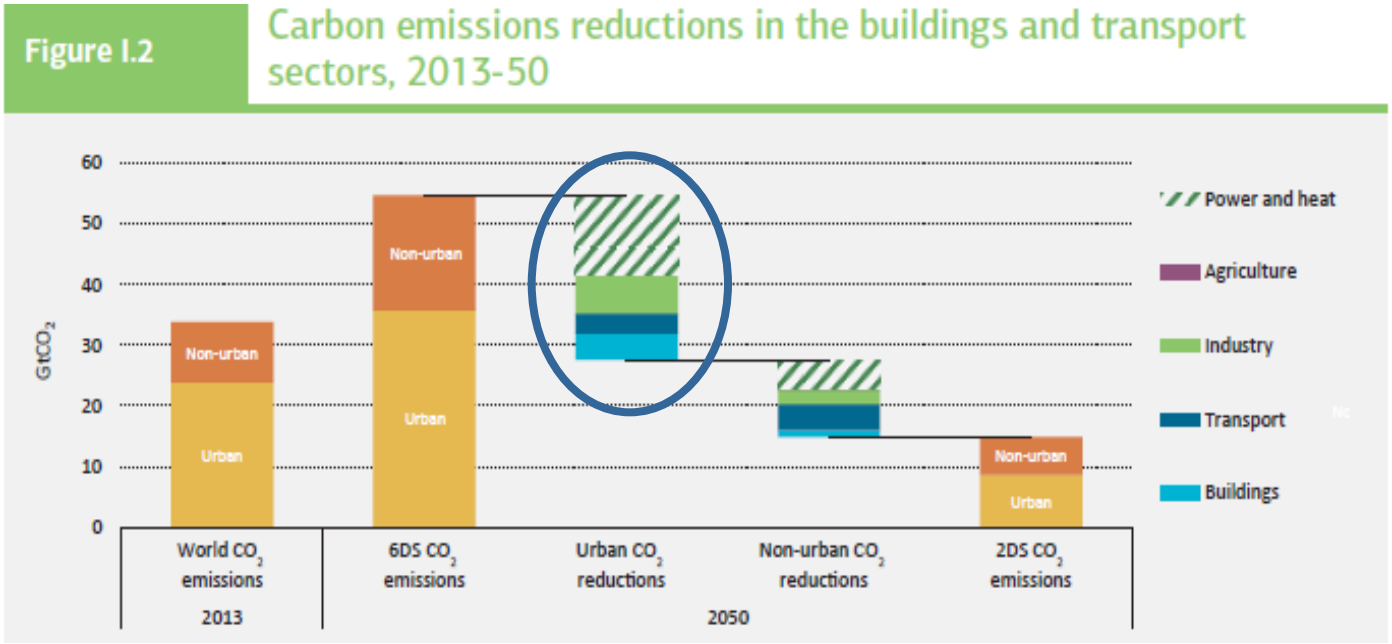
- Stadtwerk Lehen
- Integrated Heat Plan for Urban Area of Salzburg
- Energy Supply Strategy for district of Schallmoos
- Smart City Development in district of Itzling: upgrading, Buildings, energy supply, mobility
- Modernisation Strategy Goethesiedlung
- Zero Carbon Refurbishment
  F. Inhauserstraße

Phelps, 2017



“Cities are at the heart of the decarbonisation effort” (IEA ETP 2017)

- Power&Heat
- Industry
- Mobility
- Buildings



iea.org, 2016

→2/3 Urban reductions

→Tasks of Urban Planning ?

→Community Approach?

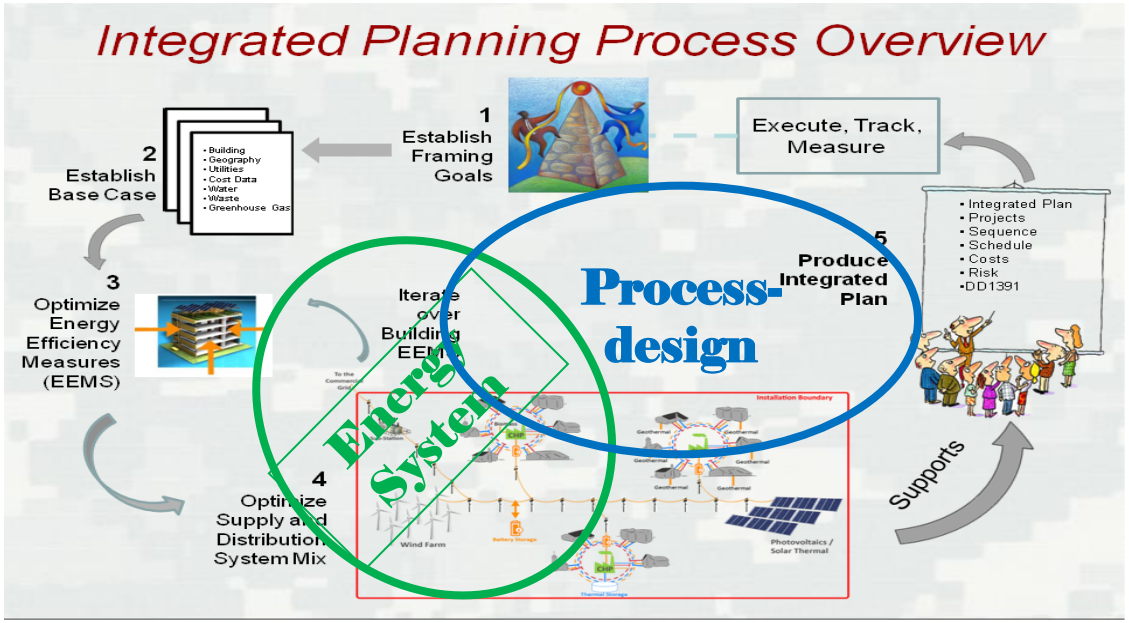
Community Approach

Community: - Scale for Investment on buildings, energy system

- Scale of Urban Planning: urban form, buildings, energy-system, storage, mobility, …

Integrated Energy Planning
EBC Annex 51: Guidebook on Successful Urban Energy Planning
ISBN: 978-3-8167-9122-5

Energy Planning&Urban Planning
EBC Annex 63: Implementation of Energy Strategies in Communities



Annex 63 - Participants

22 supporting cities, 19 organisations, 11 countries:

Salzburg, Vienna, Burlington, Guelph, London (Ontario), Toronto, Egedal, Middelfart, Roskilde, Skive, Lille, Strasbourg, Aachen, Ludwigsburg, Karlsruhe, Bottrop, Kitakyushu, Yokohama, Maastricht, Oslo, Bergen, Basel, Minneapolis

SIR, NRCan, Aalborg University, Cenergia, DTU, EIFER, B.&S.U., DV, Fraunhofer Institut, IREES, RWTH Aachen, SEAI, Osaka University, ZUYD University, NTNU, SINTEF, ENCO, Intep, University of Minnesota

Austria, Canada, Denmark, France, Germany, Ireland, Japan, Netherlands, Norway, Switzerland, USA

Objectives

"Give recommendations on procedures for implementation of optimized energy strategies at the scale of communities"

1. Develop recommendations for effective translation of a city´s energy / CO2 goals to the community scale
2. Develop recommendations for optimization of policy instruments for the integration of energy / CO2 goals into common urban planning processes
3. Develop new techniques for stakeholder cooperation along with holistic business models involving a wide range of stakeholders
4. Devise methods for the monitoring and evaluation
5. Involve cities / urban planners in order to integrate energy planning in urban planning procedures

→ put energy in urban planning processes

Research Methodology

Understand current planning practices

- Survey of Annex members
- Identification of energy efficiency measures

Categorise energy efficiency measures

- Development of Themes
- Identification of case studies
- Identification of Strategic Measures

Analysis of Strategic Measures

- Strategic measure reports
- Analysis of Approaches
- Application of Strategic Measures within case studies

Analysis of boundary conditions for implementation of measures

- Implementation methods & Support Tools
- Self assessment: priority of measures
- Necessary skills and education
- Necessary processes and knowledge

Results #1: Strategic measures

		Generalized Planning Process					
		Target setting	Analysis of situation	Potential analysis	Project planning	Realisation	Monitoring
Strategic Measures	Set Vision and Targets	■	■				
	Develop Renewable Energy Strategies	■	■	■			
	Make Full Use of Legal Frameworks			■	■	■	
	Design of Urban Competition Processes			■	■		
	Make Use of Tools Supporting the Decision Making Process		■	■	■		
	Implement Monitoring of Energy Consumption and GHG Emissions				■	■	■
	Stakeholder Engagement & Involvement	■	■	■	■	■	■
	Include Socio Economic Criteria	■	■	■	■	■	
	Implement Effective and Efficient Organisational Processes		■	■	■	■	■

Results #1: Strategic measures - Detail

For each Strategic Measure:

- Problems /Challenges
- Description of actions
- Link to case studies / national measures
- Recommendations

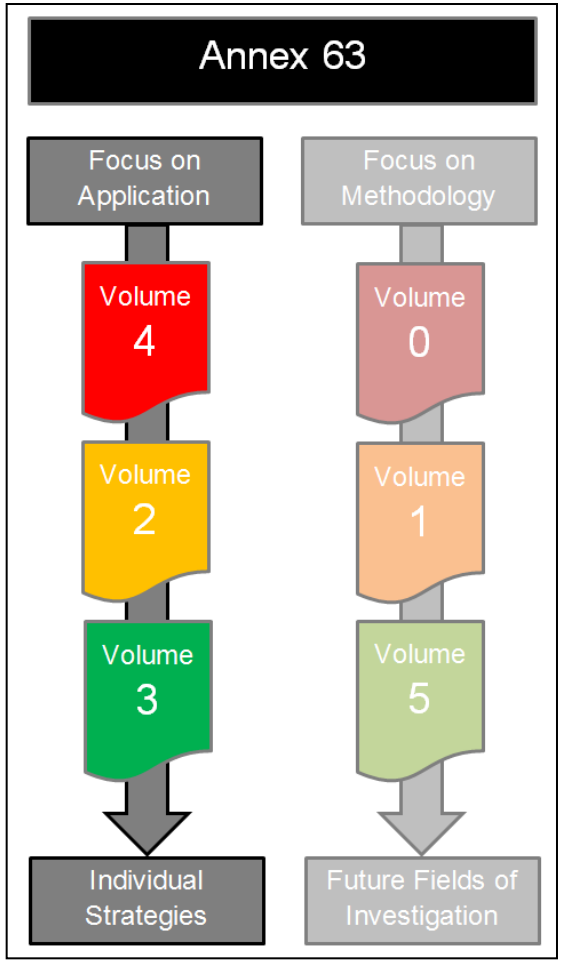
No	Country	Measures	Intent	Related Themes
25	France	Observatoire PCET	Enforcing	Feedback
42	Germany	Urban Communication Strategy (Energetikom in Lugwigsburg)	Encourage	Information
43	Germany	Consulting Services for Private Households	Encourage Enable	Information, Tools
44	Germany	Platform Energy Efficiency/ Initiative Energy Efficiency Networks	Encourage Enable	Information, Tools
56	Ireland	Wind Atlas	Enable	Information
66	Netherlands	Energy Potential Mapping	Enable	Tools

Result #2: Volume 1 - 5

Stakeholder support materials

Development of strategic measures

Application of strategic measures



Documentation of workshops

Inventory of measures

Recommendations

Results #3: Stakeholder Support Materials

- Self Assessment
- Capacity Building and Skills
- Workshop Formats
- Slide Pool
- Educational Material

Self Assessment

- Following the 9 strategic measures and their chronological application in the planning process
- 6 questions following the logic of
  - Awareness
  - Available skills/knowledge/resources
  - Regular application
  - Quality of application
  - Efficiency of application
  - Barriers and success factors

- Basis for local workshops for better verification of results
- Allows quick overview of strengths and weaknesses regarding application of strategic measures
- Might be entry point for application of advanced quality management and assessment tools

Self Assessment Tool

Question		Fully agree	Some-times	Disagree	Comment	Link to
Set Vision and Targets						
Awareness	The city is aware of the importance of a long-term vision and the benefits of a common agreement of all stakeholders regarding a vision.	x				
Available skills/knowledge/resources	The city has knowledge of different existing visions on international, national, regional and local level and knows the differences in ambition and covered topics (e.g. energy, climate, sustainability etc.).		x			Develop Renewable Energy Strategies
Regular application	The city has defined an own vision as a long-term strategy. The vision has been developed in a participative process, approved by the city council and communicated to the citizens.			x		Develop Renewable Energy Strategies Stakeholder Engagement & Involvement
Quality of application	The vision includes: - a long-term SMART goal (e.g.2050) - interim goals with a reduction path - at least energy and climate relevant aspects, if applicable also socio-economic and sustainability aspects - a link to a monitoring concept - a communication strategy			x		Make use of Tools Supporting the Decision Making Process Implement Monitoring
Efficiency of application	The vision is widely known by the stakeholders and decision makers. The long-term and interim goals found the basis for strategies, decisions and discussions on the different levels within the planning process. The monitoring proves the achievement of the interim goals			x		
Barriers and success factors	Additional text					

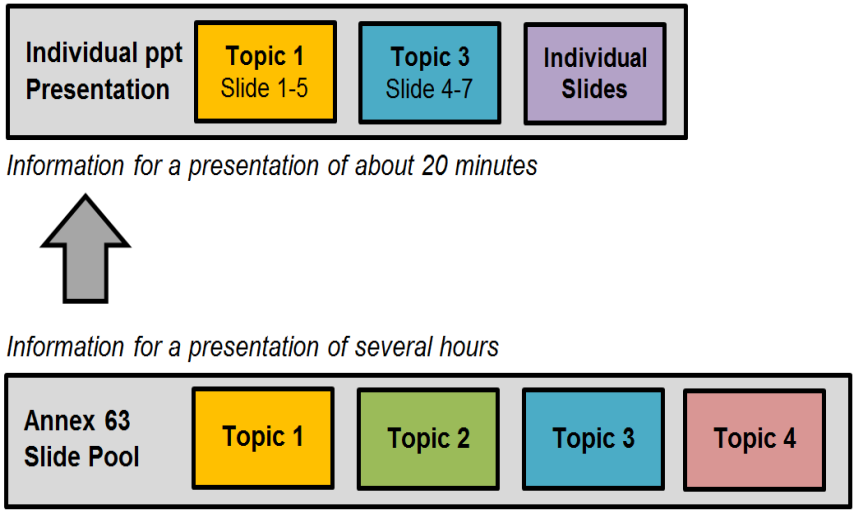
Self Assessment Visualisation

Name of the municipality	City x
Date of the assessment	16.10.2017
Participants	2 Experts

Status-Quo	**Set Vision and Targets**	**Develop Renewable Energy Strategies**	**Make Full use of Legal Frameworks**	**Design of Urban Competition Processes**	**Make Use of Tools Supporting the Decision Making Process**	**Implement Monitoring of Energy Consumption and GHG Emissions**	**Stakeholder Engagement & Involvement**	**Include Socio Economic Criteria**	**Implement Effective and efficient Organizational Processes**
Awareness	3	3	2	3	2	3	2	1	1
Available skills/knowledge/resources	2	3	1	2	1	3	1	1	2
Regular application	1	3	1	2	1	3	3	1	1
Quality of application	1	2	1	2	1	3	1	1	1
Efficiency of application	1	2	1	2	1	2	1	1	1
Barriers and success factors	N.A	N.A	N.A	N.A	We do not know which tool for our purpose	N.A	N.A	N.A	N.A

Education Materials & Slide Pool

First Semester				
Day	**Contents**	**Learning Objectives**	**Course hours**	**Add. work**
1	Introduction – Global drivers – Course concept – Expectations of students – Explanation of project work	Students should: – Understand the general objectives of the course – Express their expectation and questions	1	
1	Topic 1: Urbanisation & Demographic Change – UN World Urbanization Prospects – Demographic Change	Students should: – Know key references – Understand drivers and outlooks in different world regions	1	Student portfolio work
1	Project presentation – Presentation of design projects	Students should: – Identify relevant aspects of their own work with regard to the discussed topics – Agree on working groups – Select one project per group	4	Project poster presentation
1	Topic 2: Energy & Local Climate Change Policy – Adaptation and mitigation – GHG emission targets – Global targets example: UNEP Green Economy Report – From global to local target definition – Scope of GHG inventories	Students should: – Know the main milestones in the international climate debate – Know European, German and local targets – Understand the concept of urban carbon metric	2	
1	Feedback round – Short feedback on the first day – Discussion on project specific aspects of urban energy planning	Students should: – Define key-questions and main axis of the proposed work	2	



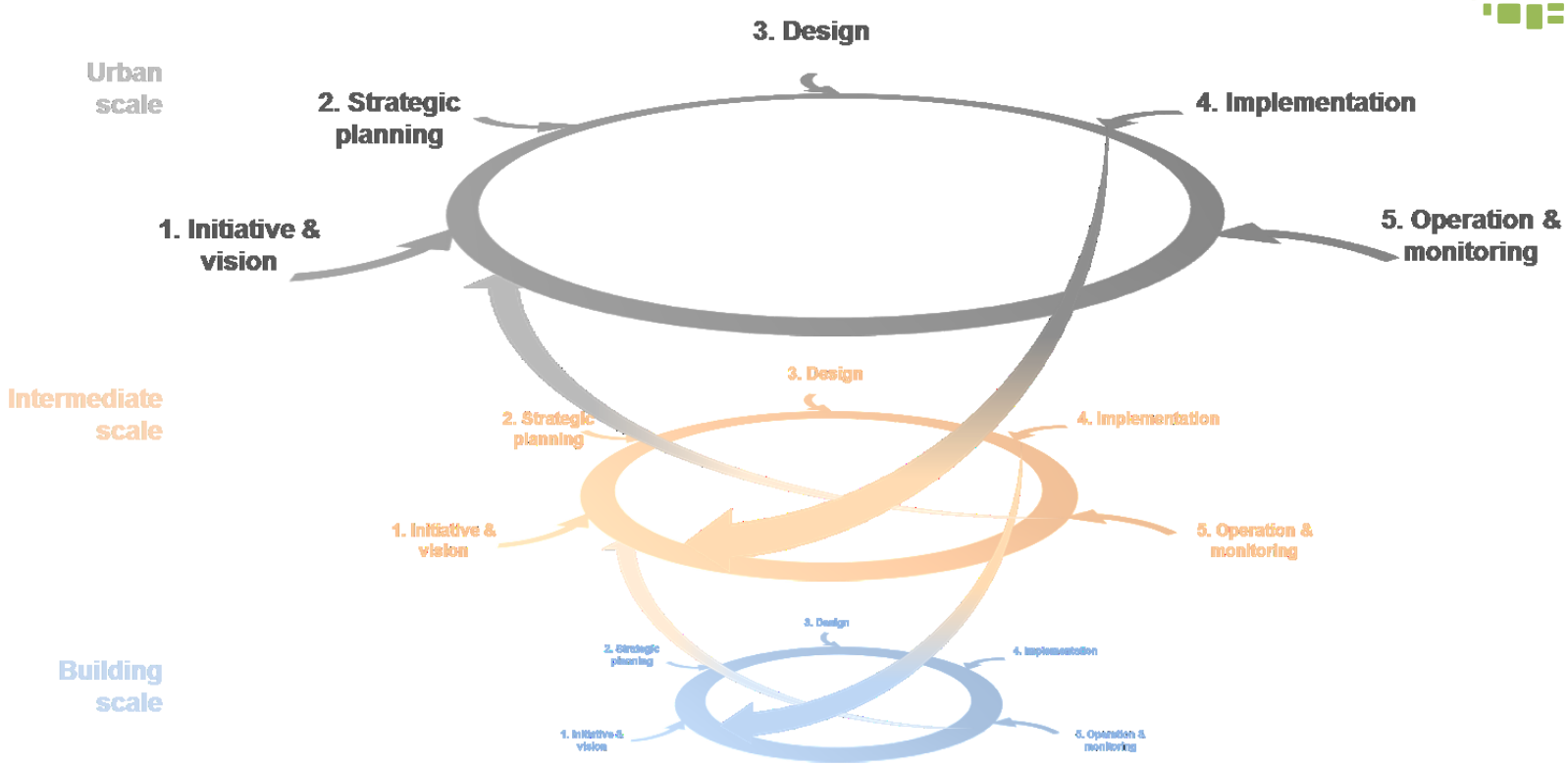
Andreas Koch
Energy Planning and Geosimulation,
EIFER

Modelling and Information Solutions for Strategic Guidance in Urban Energy Planning

Multi-Energy systems modelling for district energy planning - Berlin Tegel case study

Trondheim
16.10.2017

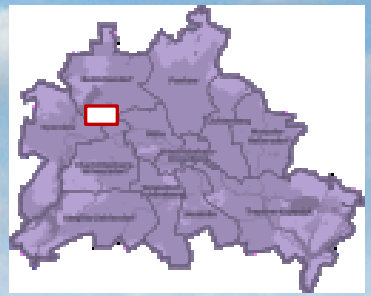
Urban Energy Planning Processes



Continuous and interconnected planning cycles, Cajot 2017

VISION BERLIN TXL 2040

BERLIN TEGEL – THE URBAN TECH REPUBLIC



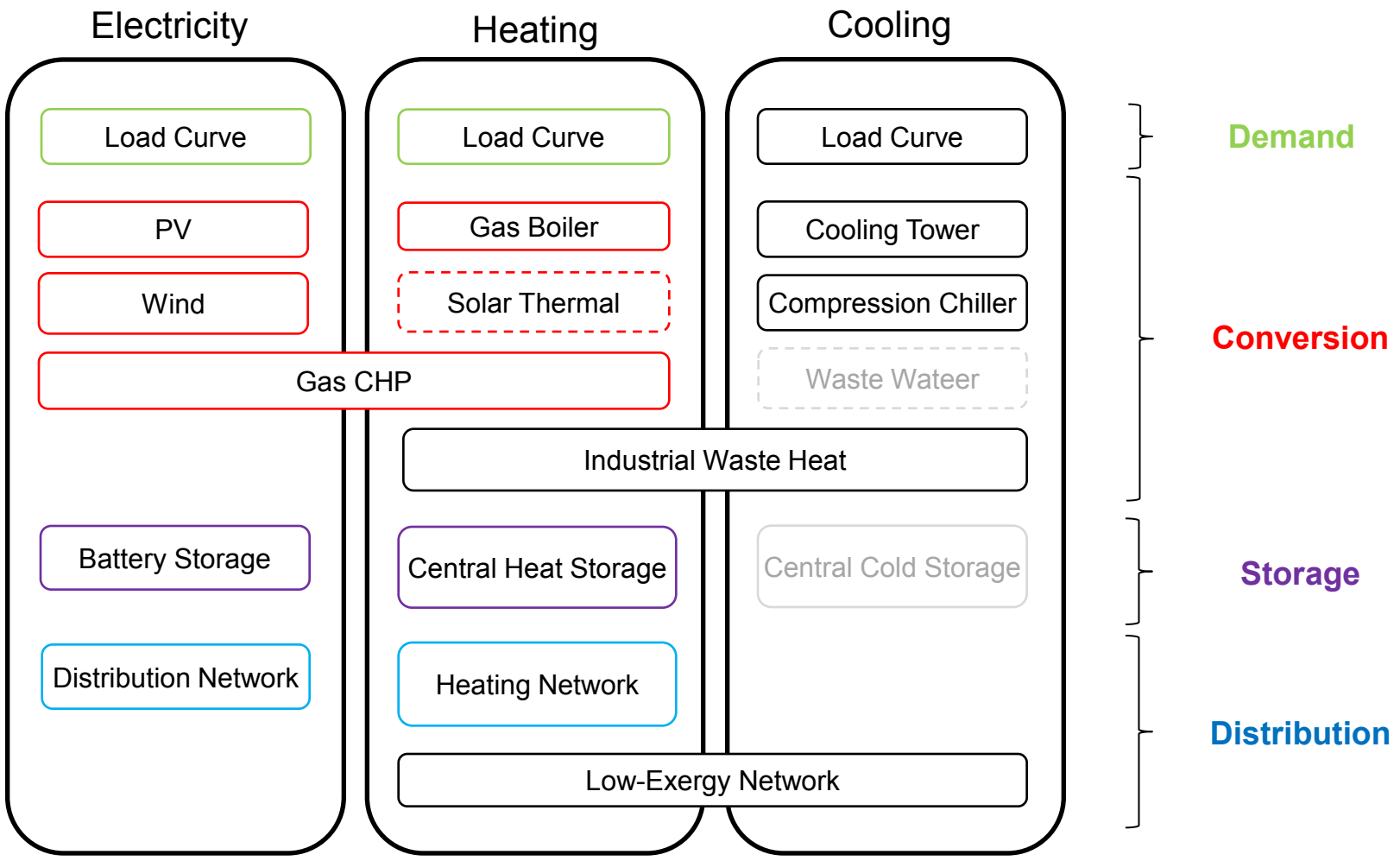
- **495** ha Total Area
- **800-1.000** Companies, Institutes, Research Activities
- **15-20.000** Jobs
- **250** ha Built Area
- **€2 Bio.** Euro Bus. Vol. p.a.
- **10.000** Inhabit.
- **10** ha Experimentation Field
- **€180 Mio.** Euro p.a. Tax Effects for Berlin State
- **5.000** Students

©Tegel Projekt GmbH

Project set-up

- **Tegel Projekt GmbH** is managing the redevelopment of the Tegel airport site
- **EDF DE and EDF R&D** are supporting the development of the energy modelling
- **EIFER** is developing innovative spatial energy modelling solutions for Tegel site
- **TU Berlin** (faculty of urban planning) is developing an integrative planning support approach: Urban Lab
- **Drees & Sommer** supported Tegel in developing its energy concept

Energy System Requirements



AGILE Decision support process

Towards more integration of urban and energy planning

WS4
Final presentation & Delivery

WS3
Result discussion and outcomes

WS2
Energy scenarios and load management

WS1
Industry 4.0 and potential interactions

Mediation

Modelling

V1.1
Flexible prototype of multi-energy system simulation

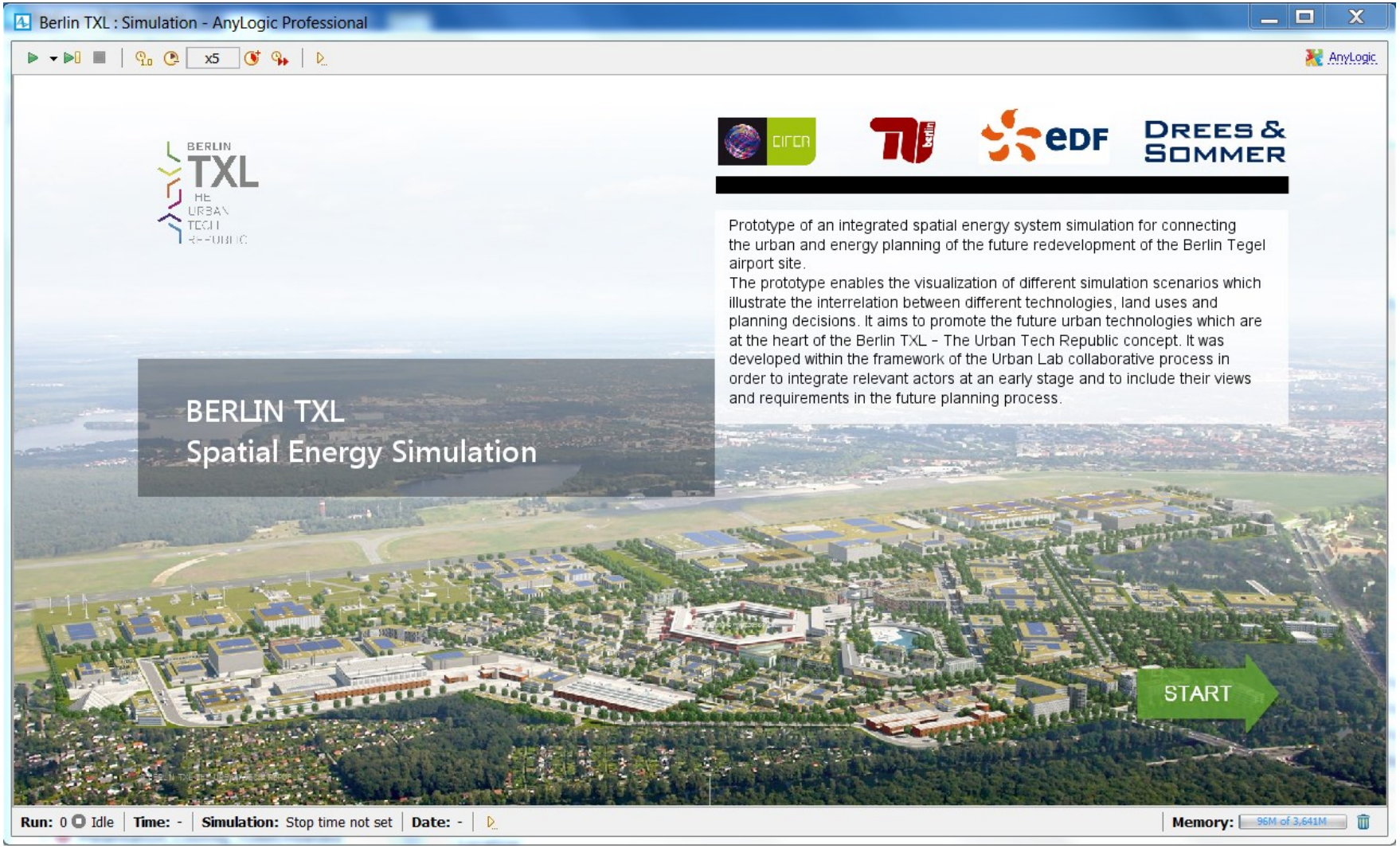
V1.0
Prototype of multi-energy system simulation

V0.3
Heating, electricity and cooling simulation (demand, distribution, storage and production)

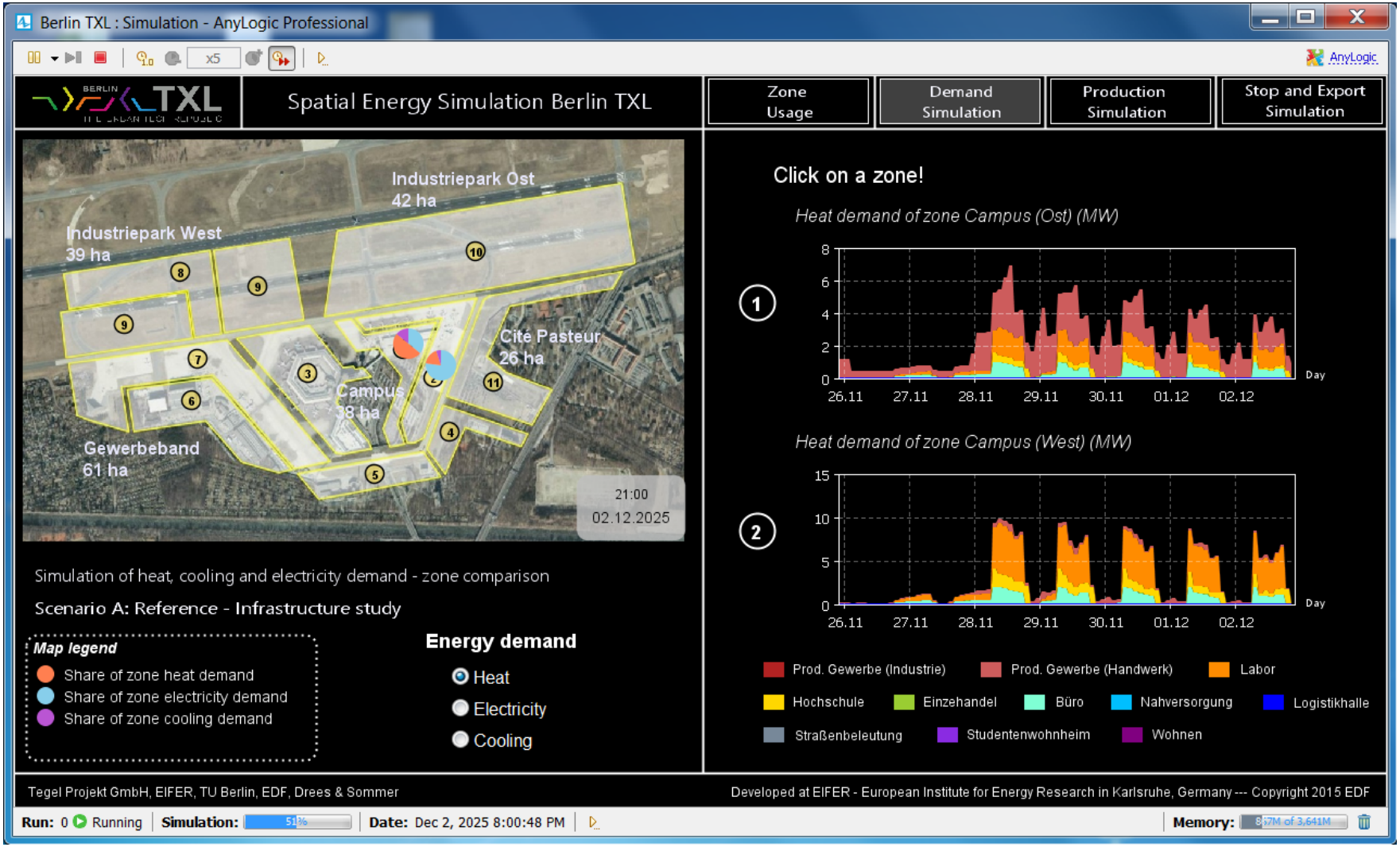
V0.2
Heating and electricity simulation (demand, distribution, storage and production)

V0.1
Master plan visualization and demand modelling

Prototype – Cover page



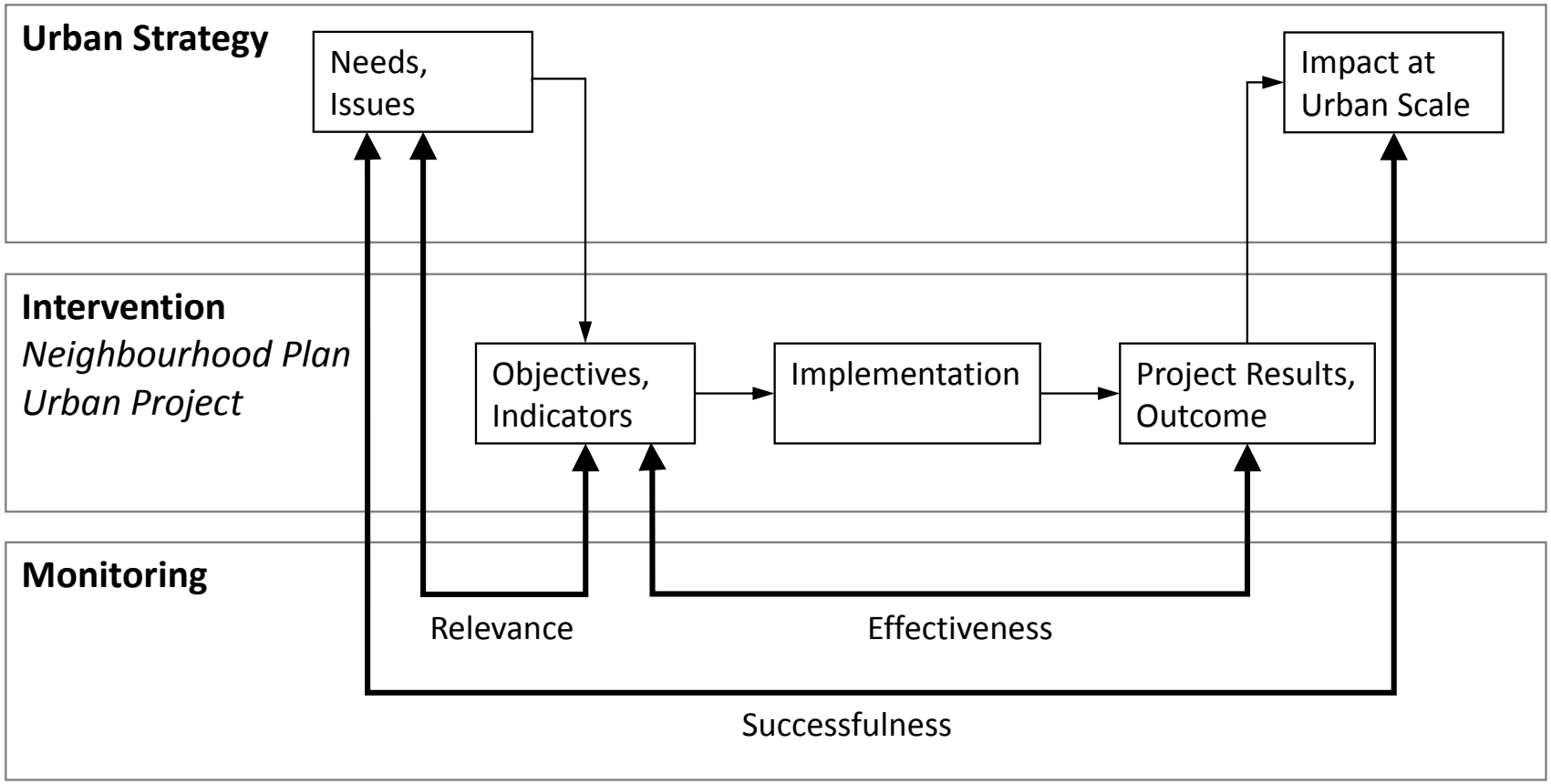
Prototype – Energy Balance



Conclusions

- Development of a simulation prototype for visualizing and analysing the local energy concept of the Tegel development project;
- **Relevance of workshops**
  - Exchange and integration of local actors (IHK, VDI, consultants, companies, etc.)
  - Refinement of the energy concept
  - Shared vision
- **Benefit of complete energy system simulation**
  - Connect vision and design (test of hypothesis, increase spatio-temporal resolution, etc.)
  - Improve the coherence of the energy concept and extend the existing studies
  - Identify open questions
- Investigate relevance of **spatial characteristics** of the energy concept;

Monitoring



Source: Strasser, H., J. Kimman, A. Koch, O. Mair am Tinkhof, D. Müller, J. Schiefelbein, C. Slotterback (forthcomming). Implementation of energy strategies in communities, Energy and Buildings.

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EIFER

Planning shows you how to reach your destination,

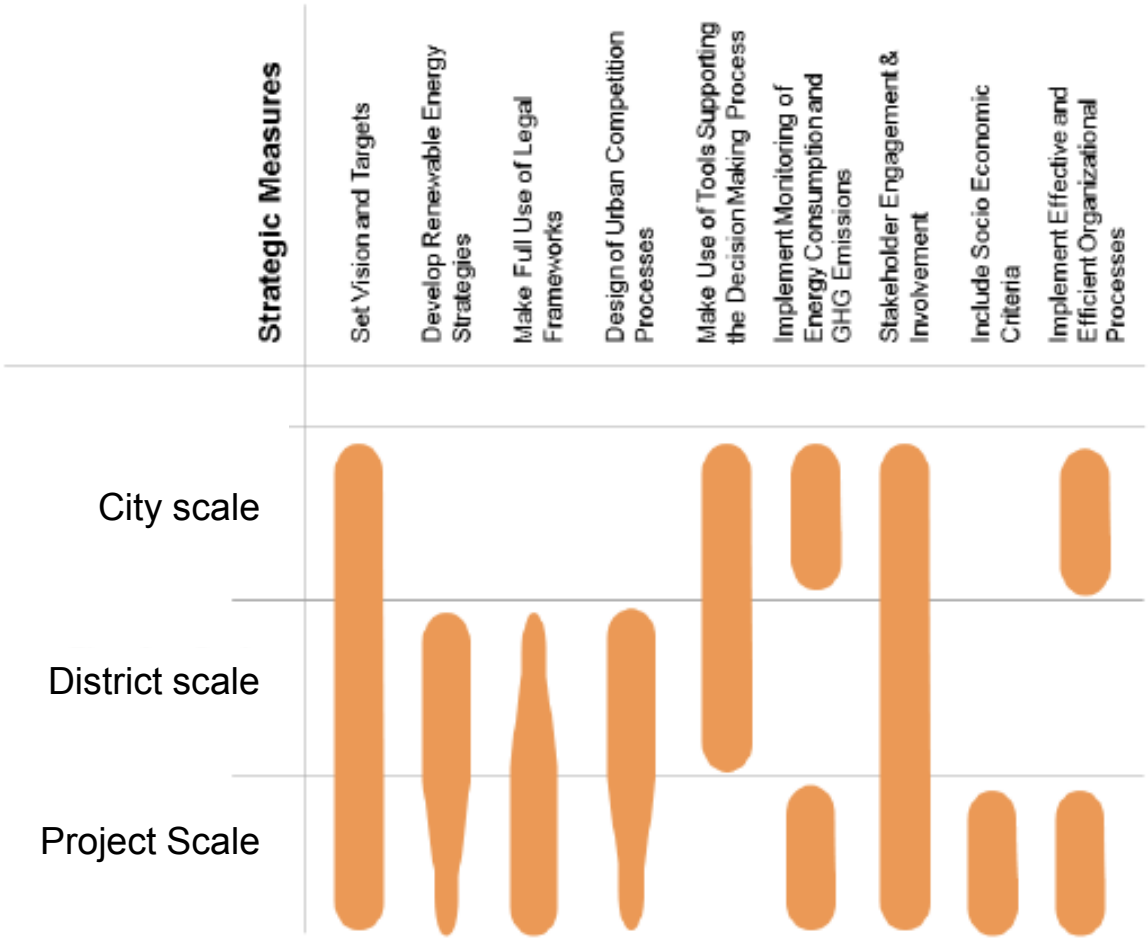
monitoring tells you if you have arrived,

impact assessment at urban scale tells you if it was worth going.

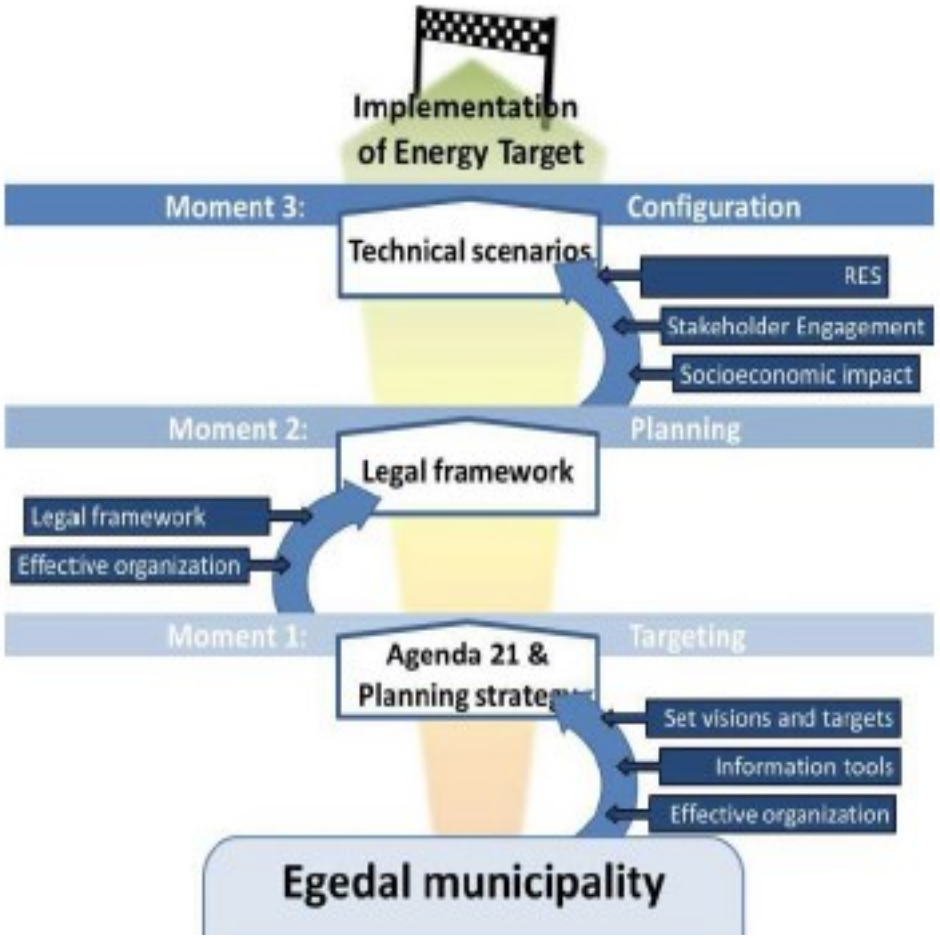
© LSECities

Volume 3:
Application of Strategic Measures

- Collected 23 case studies
- Organized into 3 scales
- Distribution of Strategic Measures across case studies

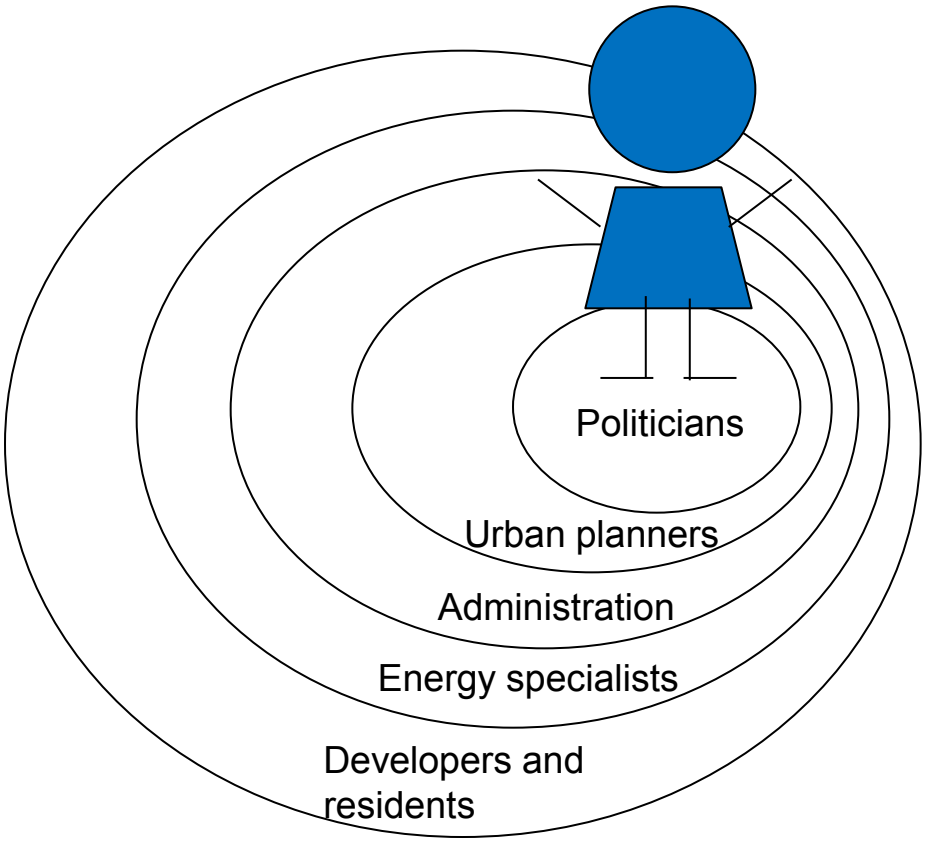


What: Strategic Measures combined



Who: Implementation Champions

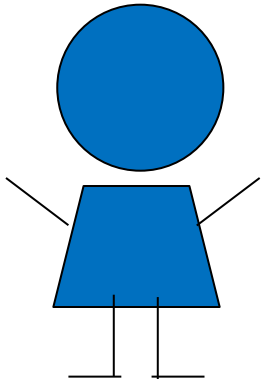
- The constellation of Imple-mentation Champions vary
  - An initiating champion is needed
  - The point of entry is not important – it provides a trajectory
  - The formation of the network of champions is context dependent
  - Expansion of the network of champions = implementation is progressing
  - A champion is only effective if she/he is able to mobilize more champions



Stenløse South, Egedal

When: Implementation moments

Championing from targets to action



Champion

City Scale

District Scale

Project Scale

Setting targets (envision)

Planning (direction)

Organizing (distribute roles)

Designing (configure)

Constructing (realise)

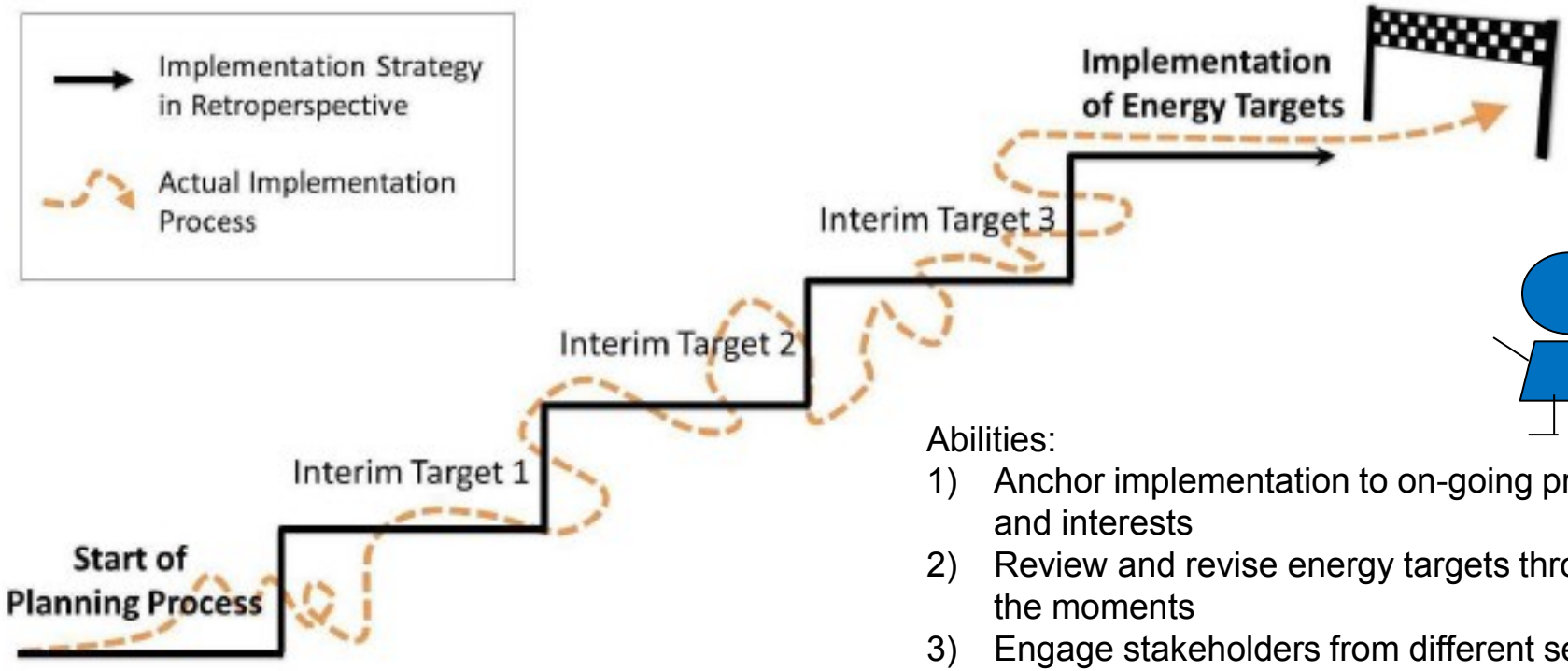
Monitoring (evaluate)

Progression of implementation

Acts of championing

How: Iterative interim steps

Linkage across projects and initiatives

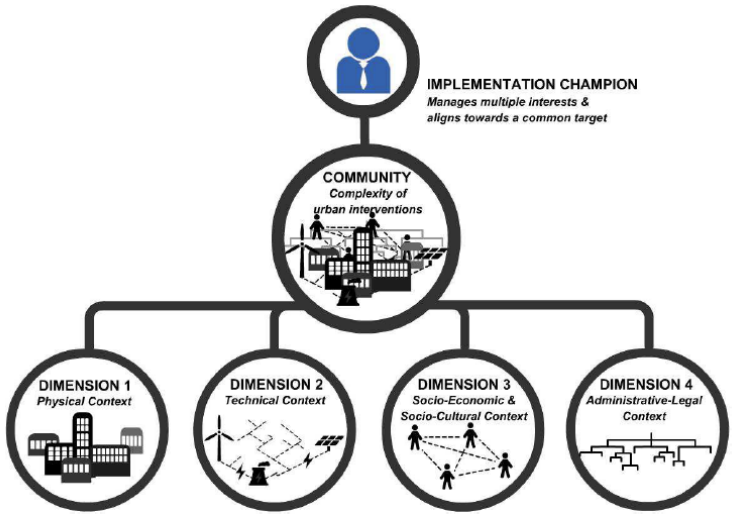


Abilities:

1) Anchor implementation to on-going projects and interests
2) Review and revise energy targets through the moments
3) Engage stakeholders from different sectors
4) Challenge resistance and bottlenecks by exploiting strategic measures.

Competencies supporting effective implementation champions

1. Create an incubation room for implementation champions
2. Strengthening strategic competencies among champions:
   - Technical
   - Socio-economic
   - Political
   - Managerial
   - Planning
   - Local community engagement
   - Facilitation



3. Recognizing the intuitive character of implementation skills
   - Ability to adjust the process to each situation
   - Learning-by-doing

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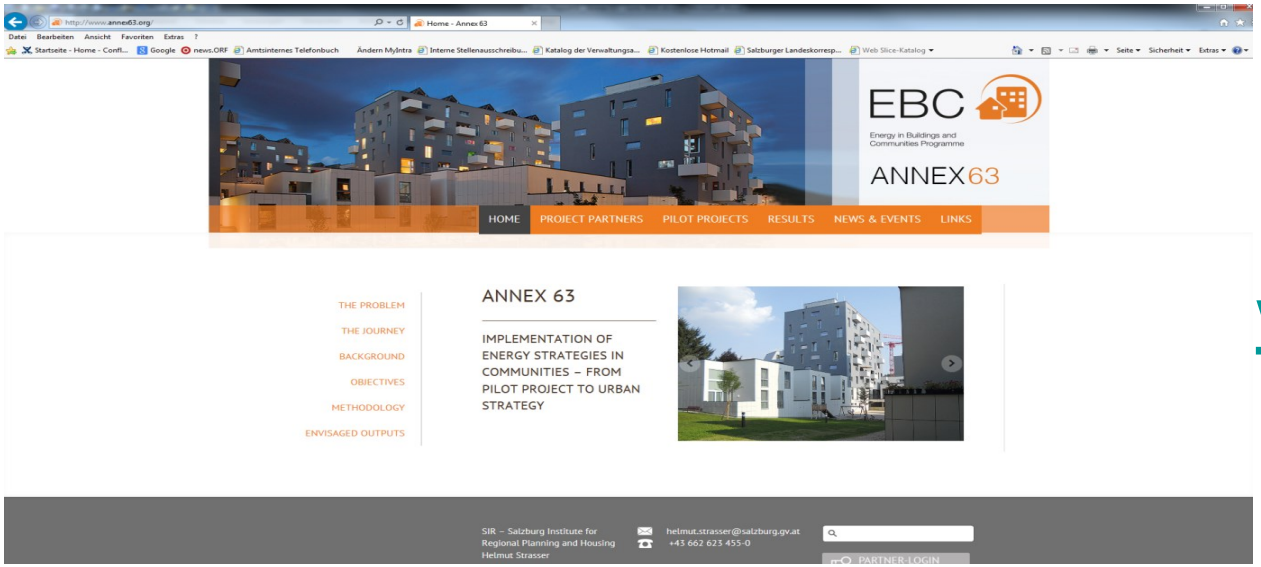

www.annex63.org

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