Subtask F. Business, Legal and Financial Aspects- Structure of the Business Guideline

1. Description and Evaluation of existing business models and financial structures in the facilitation of communities
    1. Facilitation processes of public and other communities in the commercial context
    2. Overview over major business models/ financial models: combined public and third party funded, third party funded and others: description of parties involved (questionnaire, evaluation)
    3. Innovative business and financial models for communities in other countries
2. Overview of cost and benefit structure in existing and future communities
    1. Investment costs of components: supply, control, distribution ➔ collection of cost data for the major components?
    2. Life cycle costs of communities: energy and non- energy related costs
    3. Benefits: appropriate energy production/replacement; energy cost savings, M&R cost savings, other
    4. National and supranational subsidy programs
3. Decision making criteria
    1. Description of major DMC: cash flow, ROI, NPV
4. Risk analysis
    1. Risk scenarios for investment & life- cycle costs, benefits and subsidies
5. Future Business and Financial Models

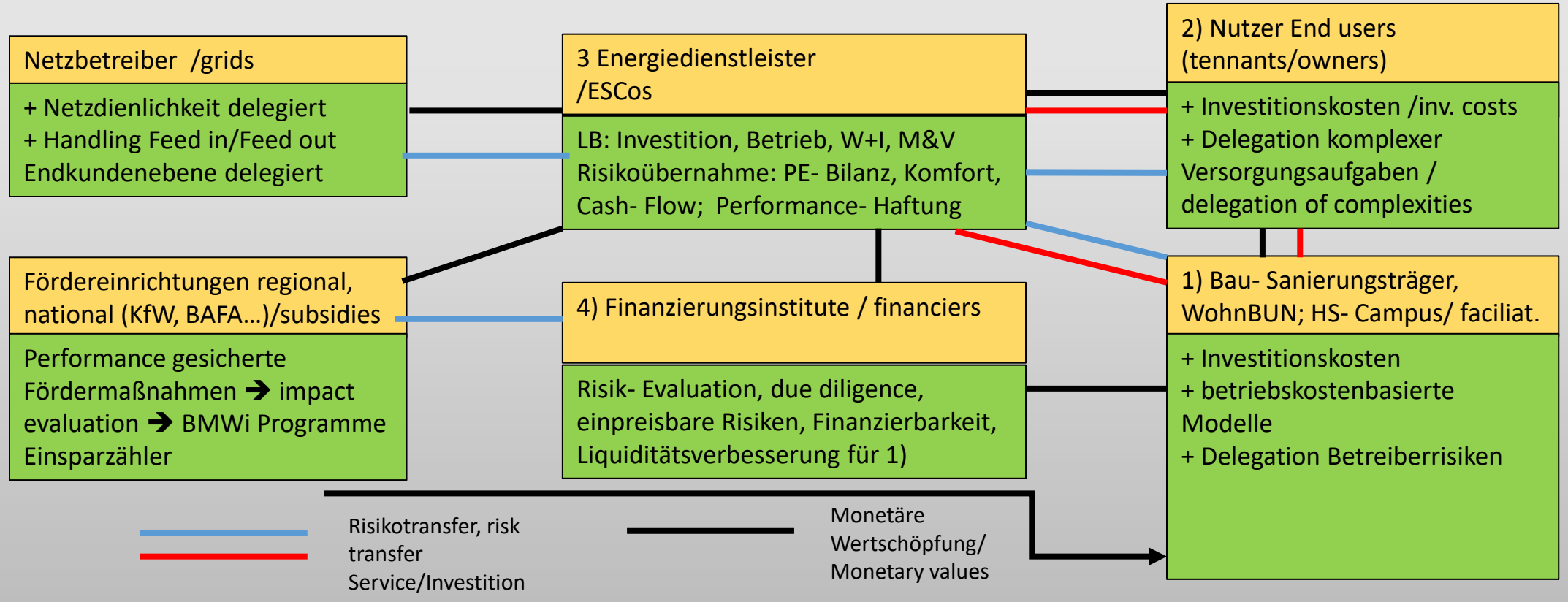
Subtask F. Business, Legal and Financial Aspects- Structure of the Business Guideline

5. Future Business Models- Future technical and organizational tasks for energy service companies
    1. Storage management
    2. Energy supply management
    3. Energy demand management
    4. Grid interaction management
    5. Resilience / interception service management
6. Implementation of Business and Financial Models in the modeling process
    1. Concept phase
    2. Modeling phase
    3. Calculation tool (tbd)

7. Case studies

Subtask F. Business, Legal and Financial Aspects- Mission and Goals

- technical- organizational structure for implementation models based on the results of A 61 which allows the cash flow based interaction between consumers, storage, production and grids



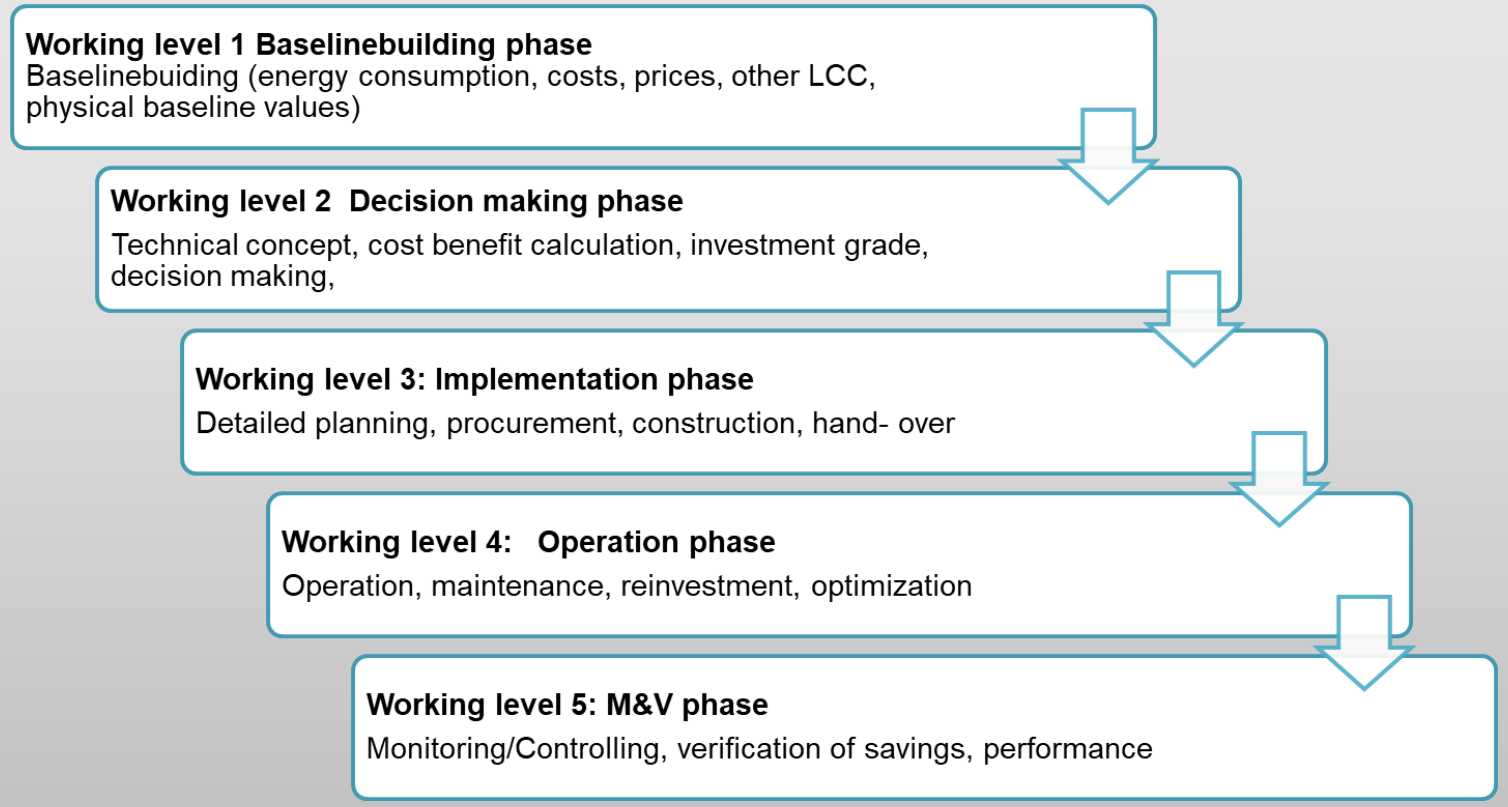
Business Model Canvas – Mannheim case study (2018)

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
ESCO Grid operator Public building owner	Energy management of the community: - Storage - Grid intersection - Energy production - Energy demand, load curve management	Optimization of cost-benefits - Capital costs resulting from 1. investment - Operational LC : maintenance/repair, operation - Operational Benefit resulting from service fees, power swap and supply heating supply, storage fees 	B2b contracts	Public community owners Public /private community owners (2. priority)
	Key Resources		**Channels** IT	

Cost Structure	Revenue Streams
First investment costs, staff costs, operational LC	Service fee, heating & power supply charges

Subtask F. : Businsess, Legal and Financial Aspects- Mission and Goals

- Risik analysis, quality assurance- exemplary calculation of default risk values for NZE project facilitation based on a five stage work flow



Subtask F. Business, Legal and Financial Aspects

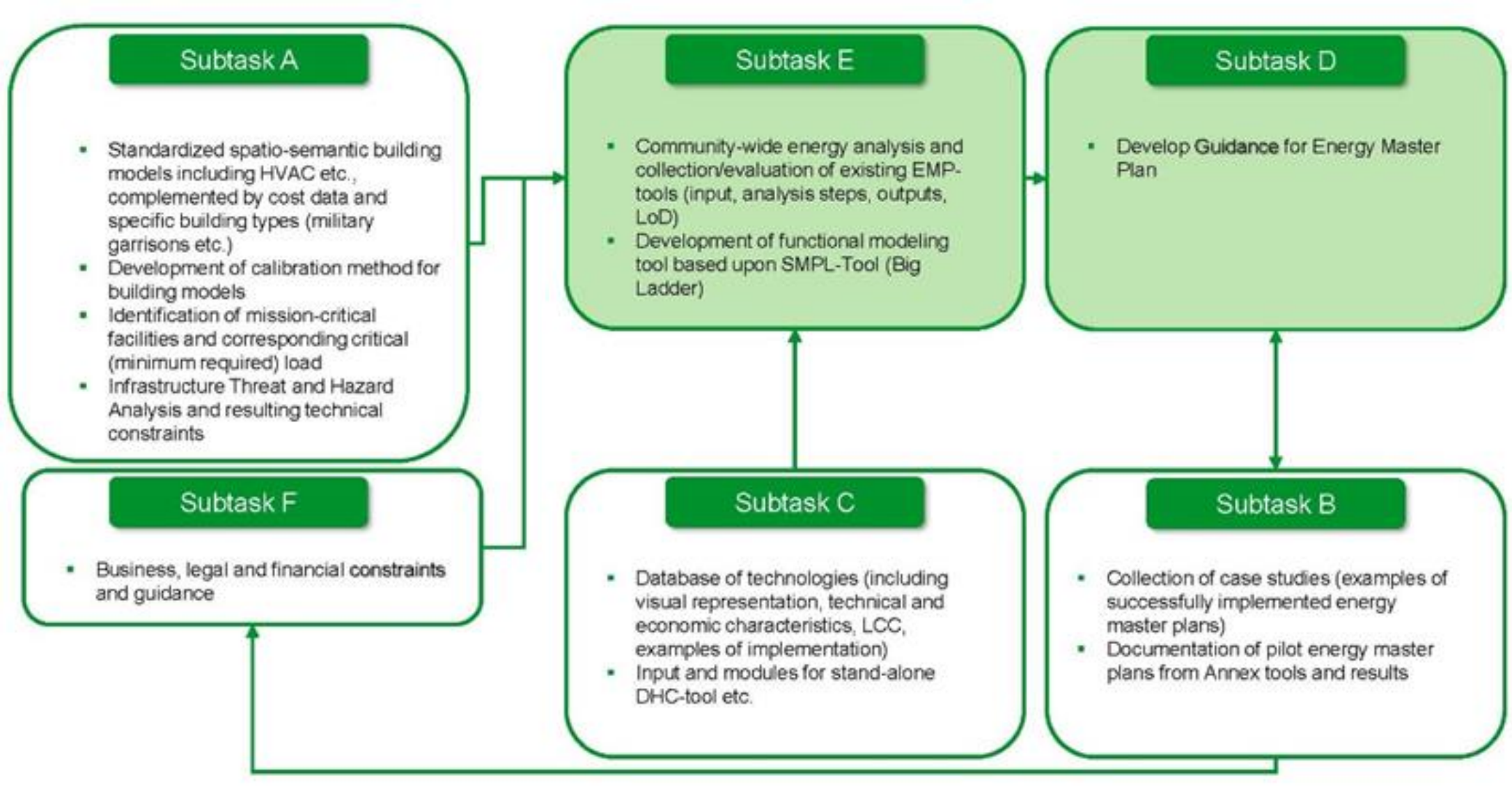
De- Risiking Matrix community refurbishment projects:

- Empiric risk data ➔ proactive evaluation of risks and de-risking processes

Risk Management Mannheim Case Study (p1 – 6)

Risk determination	Input		Empiric risk data		Risk management		gewählt	jährl. Kosten Risikomanagement €/a
Energy savings	Input /Select	De risking costs	min Risk	max Risk	min Risk	max Risk		
Baseline according to standard VDI 3807 Energy prices fixed in savings calculation	no		0%	2,50%	0,00%	0,00%	0%	0
Energy prices: volatile /n.volatile	yes		0%	0%	0%	0%	0%	0
Investment costs							Risk premiums on investment costs	
Fixed investment cost contract?	No							
Documentation of cost calculation transpareently and cross checked by third party	yes	0,2€/m²	12%	32%	0%	5%	3%	551,00 €
Harmful /toxic material analysis, fire security analysis conducted	yes							
Subsidies							Abschlag auf Subvention	
Einschätzung der Stetigkeit von laufenden Subventionen seitens Fördermittelgeber	ja		0%	30%			5%	0
Einmalige Förderung: Zuordnung Risiko individuell nach Förderprogramm	ja	KlimaschutzPlus BWL			0%	0%	0%	
Einmalige Förderung: Antragsteller hat bereits erfolgreich Anträge in diesem Programm gestellt, Gegenmaßnahmen gegen Formfehler								

Information Flow for Subtasks A-F



Participating Countries and Organizations- Status 1. Working Meeting

Subtask F			
D	Lohse	Rüdiger	Ruediger.lohse
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Operating Agents and Subtasks Co-Leads

Operating Agents	Alexander Zhivov (ERDC, USA) and Rüdiger Lohse (KEA, Germany)
Subtask A:	Scott Bucking (Carleton University, Canada) and Robert Jeffers (Sandia National Lab, USA)
Subtask B:	Ingo Leusbrock (AEE, Austria), Michael Case, (ERDC, USA)
Subtask C:	Anders Dyrelund (Ramboll, Denmark) and Domenik Hering (GEF, Germany)
Subtask D:	Ursula Eicker (Germany) and Alexander Zhivov (ERDC, USA)
Subtask E:	Peter Ellis (Big Ladder, USA) and Ursula Eicker (HFT-Stuttgart, Germany)
Subtask F:	Rüdiger Lohse, Matthias Haase

Time Schedule

- Preparation phase - one year (through November 2017)
- Working phase - 3 years (starting February 1, 2018)
- Reporting phase – 1 year

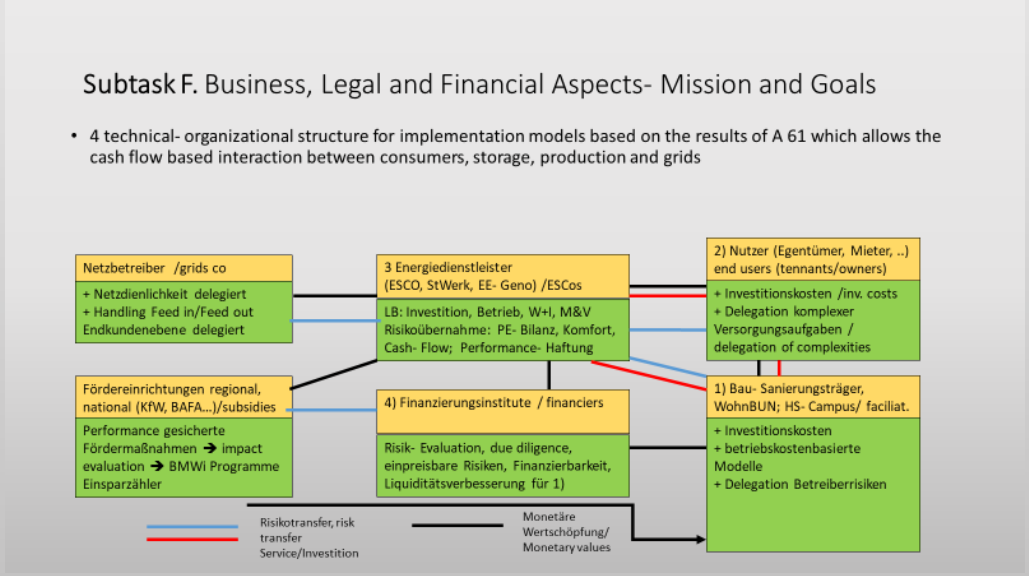
Thank you. Questions??

ST F 1. Template Framework

- Collection of existing legislation of direct relevance for NZE neighborhoods in the spatial planning process:
  - Who provides or denies allowances, obligations by regional agencies for determined areas
  - Which legislative (directly impacting) structures need to be considered when a NZE quartier is faciltated → cooperation with ST B
  - Set of major standards for the design of NZE (BREAM, CIBSE, ASHRAE)
  - Approximative number of NZE neighborhoods initiated in your country

ST F Evaluation of implementation models

- 1: Evaluation of implementation models for NZE Quartiers (Oct. 18- March 19)
  - Description of 1- 2 business as usual implementation models in each of the participating countries
  - Acting parties, value generation, monetary flows, contractual structure for the major activities following the structure of a business model template



ST F Evaluation of LCC

- 2: Evaluation of Life Cycle Cost and Benefits of NZE Quartiers
  - Template of energetic and non energetic benefits resulting from NZE implementation
  - Description of different LCC and their calculation:
    - Energy: consumption reduction, peak shaving, hourly demand response…
    - Measurement &Refurbishment: avoided maintenance cost building, HVAC
    - Additional LCC: avialble floorspace, comfort, other functional
  - Additional tools: least cost planning approach (decriptive)
  - Impact on the cost- benefit case: calculation of 2 cash- flows (BUA- Advanced LCC) and evaluation of the impact
  - Summary and calculation table

ST F Risk evaluation

- 3: Risk evaluation from the perspective of financiers:
  - Evaluation of major activities in 5 acting phases of a NZE development: (baselinebuilding, decision making, planning/design, implementation, operation and M&V)
  - Feed- back process with financiers, ESCos, project facilitators
  - Evaluation of major risks in these 5 acting phases: organizational, design related, technical)
  - De- Risking measures for the major risks (descriptive guideance)

ST F Evaluation of implementation phase

- 4: Practical implementation of results:
  - Description of the experience in the practical implementation of the LCC and framework analysis at the hand of the pilot case study
  - Comparison of BUA and advanced NZE calculation in the decision making process
  - Additional applied strategies for cost reduction such as LCC
  - Short resumee, lessons learnt → ST B, C

ST E Workflow of the scenario develoment

Building model results

Building model results

Manual corrections

1. Calculation

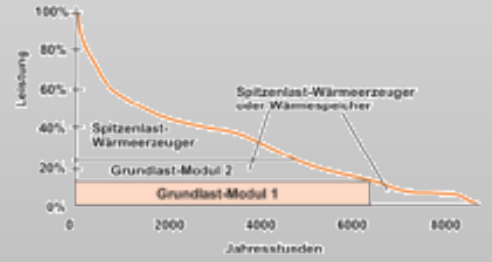
Result 1 Summarized load profile of the existing areal

Calibration at hand of metered data

Manual corrections: delete& add buildings

2. Calculation

Result2 Base Case (Status quo) Summarized load profile of the adjusted areal



Subtask B: preselected scenarios

Preselected Scenarios (combined components) for highly replicable quartiers

3. Calculation

Result 3 calculated scenarios

Evaluation by decision making criteria: costs, PEE, site energy, resilience

ST A

WP A	Outcomes	Activities /Milestones	Time line
A1	Definition of target values on building (and quartier level?)	• Collection of existing standards • Summary of methodologies used • Conclusion of methods to be used for buildings (and neighborhoods)	Juli 2018
	Representative EUIs	• Selection of representative building types/ neighborhoodtypes • Collection of EUI values (buildings /neighborhoods)	Oktober 18
	Building energy archetype models	• Definition of paramenters for the models • Definition of calculation methods • Calculation ?	Dec 18