Expert workshop
Planning and decision-making guidelines

Martin Visby Buchard, Roskilde University (DK)
Purpose

To address the implementation of circular economic practice in decision-making and planning of construction and demolition projects. The tool is developed in two parts:

1. A **framework to map key decisions** across the phases of demolition and construction, addressing the planning gap between demolition and construction projects.
   a. Indicate when decisions should be taken, which stakeholders should be involved, and what knowledge inputs are needed during different stages of the process.
   b. Address how relevant CityLoops-tools can be incorporated in the planning process supporting decision-making.

2. A **workshop format addressing organisational change** in operationalisation of circular planning and decision-making targeting three levels: i) *strategy*, ii) *operations* and iii) *capacity building*
Relation between project level and strategic level

Geels & Raven, 2006

1) Decision mapping

2) Organisational transformation

Figure 3. Technical trajectory carried by local projects

Global level (community, field)

Shared rules (problem agendas, search heuristics, expectations, abstract theories, technical models)

Emerging technological trajectory

Framing, coordinating

Aggregation, learning

Local projects, carried by local networks, characterised by local variety

Geels & Raven, 2006
1. Decision-making and planning in C&D projects
Phases and key practices
Map key practices and tools to promote:

- Screening of potential and documentation for application
- Internal communication for political mandate
- Value chain communication (procedures, requirements, execution/application)
Decision-making & planning - lessons learned in Høje Taastrup

Construction of new city hall

Demolition of Taastrupgård
Concrete

1088 tonnes recycled aggregate were used to cast the foundation with 100% recycled aggregate

Soil

9000 tonnes soil were transported from the town hall to Taastrupgaard, which corresponds to approx. 250 trucks.

Total of approx. 770 km driving with the soil instead of approx. 12,900 km (normal circumstances)
Decision-making & planning
- lessons learned in Høje Taastrup

**Phases**
- Spatial planning
- Planning
- Demolition
- Waste management
- Transformation
- Design & Planning
- Construction
- Operation and Maintenance

**Practices**
- Incorporate CE (incl. soil) in programme
- Resource mapping with buyers
- Specific materials are considered
- Requirements for specific use of resources in tenders

**Milestones**
- Pre-demotion-audit (resource mapping) Tender
- Selective demolition
- Handling Treatment Documentation
- Preparation for reuse Recycle
- Design Requirement for secondary resources Tender
- Application of secondary resources Documentation
- Environment not involved but got to present concrete test - superficial in program.
- DGNB too expensive but entrepreneur had firm vision.
- Conflict on e-modul norm. risk assessment+ agreement missing.
- Soil sent to demolition site - credit for DGNB.
- Ongoing search for potential

**Description**
- New city hall part of urban development area.
- Exploring criteria for DGNB-certification of the whole urban area.
- Municipal workgroup Area develop company
- Local plan Strategic budget Vision
- Pre-demotion-audit (resource mapping) Tender
- Selective demolition
- Handling Treatment Documentation
- Preparation for reuse Recycle
- Design Requirement for secondary resources Tender
- Application of secondary resources Documentation
- Environment not involved but got to present concrete test - superficial in program.
- DGNB too expensive but entrepreneur had firm vision.
- Conflict on e-modul norm. risk assessment+ agreement missing.
- Soil sent to demolition site - credit for DGNB.
- Ongoing search for potential

**Actors**
- Waste treatment company
- Concrete supplier
- Steering group
- Entrepreneurs
- Municipal workgroup
- Area develop company
- External client
- Demolition contractor
- Client
- Waste treatment company
- Concrete supplier
- Professional department
- Environmental department
- Entrepreneur consortium
- Architect
- Authority
- Demolition contractor
- Building department
- Waste department
- Concrete supplier
- Advisor

**High amount of PCB to clean - environmental screening
- Ongoing dialog on securing clean concrete fraction
- Waste reporting and classification.
- EoW analysis for CPR.
- Dispensation for >20% agg. - now 100% part of DK norm
- Crushing, sorting and certification concrete (EoW)
- Mixing of concrete
- Environment not involved but got to present concrete test - superficial in program.
- DGNB too expensive but entrepreneur had firm vision.
- Ongoing search for potential

**New city hall part of urban development area.
- Exploring criteria for DGNB-certification of the whole urban area.
- Municipal workgroup Area develop company
- Local plan Strategic budget Vision
- Pre-demotion-audit (resource mapping) Tender
- Selective demolition
- Handling Treatment Documentation
- Preparation for reuse Recycle
- Design Requirement for secondary resources Tender
- Application of secondary resources Documentation
- Environment not involved but got to present concrete test - superficial in program.
- DGNB too expensive but entrepreneur had firm vision.
- Conflict on e-modul norm. risk assessment+ agreement missing.
- Soil sent to demolition site - credit for DGNB.
- Ongoing search for potential

**Actors**
- Waste treatment company
- Concrete supplier
- Steering group
- Entrepreneurs
- Municipal workgroup
- Area develop company
- External client
- Demolition contractor
- Client
- Waste treatment company
- Concrete supplier
- Professional department
- Environmental department
- Entrepreneur consortium
- Architect
- Authority
- Demolition contractor
- Building department
- Waste department
- Concrete supplier
- Advisor

**High amount of PCB to clean - environmental screening
- Ongoing dialog on securing clean concrete fraction
- Waste reporting and classification.
- EoW analysis for CPR.
- Dispensation for >20% agg. - now 100% part of DK norm
- Crushing, sorting and certification concrete (EoW)
- Mixing of concrete
- Environment not involved but got to present concrete test - superficial in program.
- DGNB too expensive but entrepreneur had firm vision.
- Ongoing search for potential
2. Organisational Transformation
Strategy
how to implement circular economy in strategies to give mandate and obligate all parties to work in this ‘circular’ direction together across disciplines

Operations
how to operationalize a ‘doing your normal job in another way’ based on the strategic/political mandate

Capacity building
what new knowledge and competencies are needed to support this organizational shift
(Co)developing an approach for organisational change

**Activity**
- Codevelop framework & strategy mapping
- Virtual kick-off workshop
- Interviews
- Physical workshop
- Embedding
- Evaluation

**Outcome**
- Joint understanding of organisational change
- Initiate joint reflection
- Indepth reflection on individual role
- Reflection for joint action
- Secure adoption and sustained commitment
- Learnings and adjustments

**Output**
- Framework and strategic mandate
- Themes:
  - Economy
  - Policy & leadership
  - Cooperation
  - Knowledge
  - Time
- Potentials and barriers for implementation of circular practice
- What and how to implement?
- Obstacles and how they were tackled
- Effect and lessons learned
(Co)developing an approach for organisational change

Current situation

At what stage is the city strategically? *E.g., establishing political vision / Operationalisation of vision*

What are the limits circular mandat? *E.g., from project to project / specific geographic area*

Challenges

<table>
<thead>
<tr>
<th>Cross-cutting cooperation</th>
<th>Knowledge and Competences</th>
<th>Time</th>
<th>Economy</th>
<th>Policy and management</th>
</tr>
</thead>
</table>

Development actions

How to promote circular economy in construction & demolition and urban development (soil and construction materials)?

**STRATEGIC LEVEL**

**OPERATIONAL LEVEL**
## Strategy mapping (current situation)

A mapping in Municipalities of policies, strategies and plans that support circular practice in construction & demolition and city development.

<table>
<thead>
<tr>
<th>HTK (example)</th>
<th>Climate mitigation</th>
<th>Construction waste</th>
<th>Sustainable procurement</th>
<th>Value chain collaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wasteplan 2014-2024</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Climate actionplan 2020</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procurement strategy 2020</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procurement actionplan 2020</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development strategy 2032</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Climate actionplan 2030</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Housing policy 2021-2033</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Strategy mapping (current situation)

<table>
<thead>
<tr>
<th>Wasteplan 2014-2024</th>
<th>Climate mitigation</th>
<th>Construction waste</th>
<th>Sustainable procurement</th>
<th>Value chain collaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate actionplan 2020</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procurement strategy 2020</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procurement actionplan 2020</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development strategy 2032</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Climate actionplan 2030</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Housing policy 2021-2033</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Climate actionplan 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr.</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>36</td>
</tr>
<tr>
<td>39</td>
</tr>
<tr>
<td>43</td>
</tr>
<tr>
<td>45</td>
</tr>
<tr>
<td>50</td>
</tr>
</tbody>
</table>
## Current situation

### At what stage is the city strategically? *E.g., establishing political vision / Operationalisation of vision*

<table>
<thead>
<tr>
<th>Location</th>
<th>Stage</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mikkeli (FI)</td>
<td>Embedding political vision</td>
<td>CE in city strategy and climate action plan</td>
</tr>
<tr>
<td>Høje Taastrup (DK)</td>
<td>Operationalising political vision</td>
<td>CE in climate action plan and housing policy</td>
</tr>
<tr>
<td>Roskilde (DK)</td>
<td>Operationalising political vision</td>
<td>CE in climate action plan and properties strategy</td>
</tr>
</tbody>
</table>

### What are the limits circular mandat? *E.g., from project to project / specific geographic area*

<table>
<thead>
<tr>
<th>Location</th>
<th>Limits</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mikkeli (FI)</td>
<td>From project to project but currently</td>
<td>business as usual</td>
</tr>
<tr>
<td>Høje Taastrup (DK)</td>
<td>From project to project</td>
<td></td>
</tr>
<tr>
<td>Roskilde (DK)</td>
<td>Specific geographic area and diffusion to</td>
<td>other projects</td>
</tr>
</tbody>
</table>
Roskilde – Strategic action to operation

**Climate Action Plan**
- DGNB certification of all new building
- Reuse/Recycling of construction and demolition waste
- Lifecycle assessment of construction projects

**Property strategy & Action Plan**
- Economic, social and environmental sustainability in all construction projects
- CO₂ emission in construction projects
- Circular economy and tender practice

**Project Specific Sustainability Plan**
- Total cost of ownership
- Lifecycle assessment
- Adaptable building
- Reuse/recycling potential
- Design for disassembly

---

**Required to document in offer**

---

Roskilde Kommune ± P-hus Indfaldet på Musicon

Udbudsbetingelser 27.0.9.2019

I

Required to
document in offer

§

H2020 - CE - SC5 - 03 - 2018 – Demonstrating systemic urban development for circular and regenerative cities

Proposal Submission: Stage 1: February 2018 and Stage 2: September 2018

Funding received December 2018; project start October 2019

Total funding EUR 10 mio

CityLoops

Consorium:
- 28 European partners in 7 cities across Europe (Høje Taastrup, Roskilde, Apeldoorn, Mikkeli, Bodø, Serville and Porto)

Core content of the project:
- Demonstration cases: recycling organic waste, soil and construction and demolition waste
- Development and demonstration of planning tools (+20 tools) and business cases
- Circular city scans and material flow analysis
Recycled concrete, soil and wood panels

DGNB Gold-certified

Analyzes of the concrete quality

Timing and materials

Price weighed 50 percent, CSR and resident process

No specific requirements – a supplement in the tender

Climate Plan

Recycling of building materials and circular economy

All tenders include a individual assessment of CE products

Housing Policy

Increased energy efficiency in own buildings

Sustainability certification and labeling schemes

Sustainable resource utilization, e.g. recycling building materials when existing buildings are to be demolished
## Organisational challenges
- lessons learned in Høje Taastrup, Roskilde & Mikkeli

<table>
<thead>
<tr>
<th>Cross-cutting cooperation</th>
<th>Knowledge and Competences</th>
<th>Time</th>
<th>Economy</th>
<th>Policy and management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tasks and economy are too tied up in divided departments</td>
<td>Shared learning as a basis for dialogue</td>
<td>Time to organize networks</td>
<td>Allocation of financial resources</td>
<td>Political focus translated into concrete guidelines (tasks and roles)</td>
</tr>
<tr>
<td>Integrate sustainability from the start</td>
<td>Room for experimentation</td>
<td>Time for reflection and evaluation</td>
<td>How is sustainability valued?</td>
<td>Mandate from managerial level in the execution of political visions</td>
</tr>
<tr>
<td>Structured involvement of relevant actors to become a joint project</td>
<td></td>
<td></td>
<td></td>
<td>Support political decision-making processes</td>
</tr>
</tbody>
</table>

**Upscaling of experiments**

**Diffusion from grassroots**

**Systematic handling of resources**
Organisational challenges - lessons learned in Høje Taastrup, Roskilde & Mikkeli

1. There are a lot of competences and knowledge across the organisation, but they are often randomly activated.

2. Allocate resources for experimentation – To experiment you need resources for pre-analyses and more time, but to convince for this, you need good cases.

3. Management plays an important role in implementing political strategies and setting the direction: priorities and guidelines.
Strategic level \(\ll\) Operational level

Recap

Figure 3. Technical trajectory carried by local projects

Geels & Raven, 2006
Development actions
- lessons learned in Mikkeli, Høje Taastrup & Roskilde
### Strategic actions

#### Mikkeli (FI)
1. **Strategy alignment**
   - Departments adopt the goals in climate action plan
   - Property strategy (incl. construction, renovating and demolition -plan)
   - Implementation plan of procurement strategy
2. **Better interconnection between:**
   - i. planning,
   - ii. demolition and
   - iii. construction

#### Høje Taastrup (DK)
1. **Strategy alignment and professional pride**
   - Strategy for active ownership as culture change
   - Property strategy (incl. plot sales - min. requirements
   - Specific actions for departments in new sustainability strategy
2. **Adoption of strategies across disciplines**
   - Budget item or percentage for CE I projects
   - Dialog tool across organisation for political prioritization and mandate

#### Roskilde (DK)
1. **Mandate and professional pride**
   - Formalization of political mandate
   - Focus on responsibility and risk
   - Clear gains, vision and success criteria
   - Submit specific projects for political approval
   - Input to strategies and signature programmes
2. **Adoption of strategies across disciplines**
   - Common language and concepts
   - Economy and time for early screening
   - Room for grassroots
   - Mentoring scheme

### Operational actions

#### Mikkeli (FI)
1. **Knowledge sharing and diffusion**
   - Develop a group across siloes
2. **Develop practices and procedures**
   - Implementation of strategies and plans in guidelines (with best cases)
   - Procurement guides for specific branches/services
   - Involve procurement manager and specialist in development projects
   - Identify key persons at different levels – who is in charge?

#### Høje Taastrup (DK)
1. **Develop practices and procedures**
   - Process to integrate CE when initiating projects
   - Early cooperation regarding local plans and tenders
   - Resource screening common procedures as environmental screening
   - Early screening of potentials
2. **Knowledge sharing and diffusion**
   - Quantitative business cases
   - Formalize early involvement of internal experts
   - Identify persons with expertise in departments
3. **Value chain communication**
   - Paradigm to communicate political focus to developers
   - Dialog tool for early value chain communication

#### Roskilde (DK)
1. **New project areas**
   - Diffusion from Musicon to e.g. Sankt Hans area
2. **Develop practises and procedures**
   - Tender requirements
   - Requirements/guidelines for plot sales
   - Early screening of potentials
3. **Resource mapping (incl. soil) as basis for municipal development plan**
4. **Establish permanent material bank**
5. **Collect knowledge and experience**
   - Platform for cases and inspiration template
   - One page med cases and videos for dissemination
## Strategic actions

<table>
<thead>
<tr>
<th>Mikkeli (FI)</th>
<th>Høje Taastrup (DK)</th>
<th>Roskilde (DK)</th>
</tr>
</thead>
</table>
| **1. Strategy alignment**  
  • Departments adopt the goals in climate action plan  
  • Property strategy (incl. construction, renovating and demolition -plan)  
  • Implementation plan of procurement strategy  
| **1. Strategy alignment and professional pride**  
  • Strategy for active ownership as culture change  
  • Property strategy (incl. plot sales) - min. requirements  
  • Specific actions for departments in new sustainability strategy  
| **1. Mandate and professional pride**  
  • Formalization of political mandate  
  • Focus on responsibility and risk  
  • Clear gains, vision and success criteria  
  • Submit specific projects for political approval  
  • Input to strategies and signature programmes  

| **2. Better interconnection between:**  
  i. planning,  
  ii. demolition and  
  iii. construction | **2. Adoption of strategies across disciplines**  
  • Budget item or percentage for CE I projects  
  • Dialog tool across organisation for political prioritization and mandate | **2. Adoption of strategies across disciplines**  
  • Common language and concepts  
  • Economy and time for early screening  

| **Operational actions**  
<table>
<thead>
<tr>
<th>Mikkeli (FI)</th>
<th>Høje Taastrup (DK)</th>
<th>Roskilde (DK)</th>
</tr>
</thead>
</table>
| **1. Knowledge sharing and diffusion**  
  • Develop a group across siloes  
| **1. Develop practices and procedures**  
  • Implementation of strategies and plans in guidelines (with best cases)  
  • Procurement guides for specific branches/services  
  • Involve procurement manager and specialist in development projects  
  • Identify key persons at different levels – who is in charge? | **1. New project areas**  
  • Diffusion from Musicon to e.g. Sankt Hans area  
| **1. Knowledge sharing and diffusion**  
  • Quantitative business cases  
  • Formalize early involvement of internal experts  
  • Identify persons with expertise in departments  
| **3. Resource mapping (incl. soil) as basis for municipal development plan**  
| **2. Develop practises and procedures**  
  • Tender requirements  
  • Requirements/guidelines for plot sales  
  • Early screening of potentials  
| **3. Resource mapping (incl. soil) as basis for municipal development plan**  
| **2. Knowledge sharing and diffusion**  
  • Quantitative business cases  
  • Formalize early involvement of internal experts  
  • Identify persons with expertise in departments  
| **4. Establish permanent material bank**  
| **3. Value chain communication**  
  • Paradigm to communicate political focus to developers  
  • Dialog tool for early value chain communication  
| **5. Collect knowledge and experience**  
  • Platform for cases and inspiration template  
  • One page med cases and videos for dissemination  

### Practical tools

1. Collect, spread and adjust tools
   - DGNB, CO2-calculator, resource mapping, material passport, material database, soil prognosis, geotechnical test
   - Introduction guides/videos
   - Superusers in every department
   - Introduction courses
   - Identify potentials in every department

2. Knowledge sharing and diffusion
   - Resource screening common procedures as environmental screening
   - Early screening of potentials

3. Value chain communication
   - Paradigm to communicate political focus to developers
   - Dialog tool for early value chain communication

4. Establish permanent material bank
5. Collect knowledge and experience
   - Platform for cases and inspiration template
   - One page med cases and videos for dissemination
Next steps

Mapping of Planning and decision-making

- Further focus mapping on specific practices
- Final tool/framework development

Organisational transformation

- Replication workshop in Seville

Embedding activities in Roskilde and Høje Taastrup

- Roskilde: Sustainability group discussions on i) concretize and prioritize actions, ii) cases and iii) theme meetings
- Høje Taastrup: Workshop results as specific input to new sustainability strategy
THANK YOU
VERY MUCH!

Website:  www.circularcities.eu
E-mail us:  info@circularcities.eu
Follow us on Twitter:  @CircularCityEU
Join the conversation:  #CityLoops