Joint Session
‘Smarter Together’ SCC-01 project and ‘Integrated Planning, Policy and Regulations’ Action Cluster Meeting

27 June 2018
Hotel Marinela, Sofia (BG)
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 – 9:15</td>
<td>Welcome and Introduction&lt;br&gt;Georg Houben – EC&lt;br&gt;Simona Costa – AC Leader&lt;br&gt;Georgi Georgiev – Fraunhofer Institute for Building Physics</td>
</tr>
<tr>
<td>10:45 – 11:00</td>
<td>Coffee Break</td>
</tr>
<tr>
<td>11:00 – 11:30</td>
<td>Energy Efficiency – Roadmap for Sofia&lt;br&gt;Georgi Georgiev – Fraunhofer Institute for Building Physics</td>
</tr>
<tr>
<td>11:30 – 12:00</td>
<td>The Smart City Guidance Package&lt;br&gt;<strong>Brief introduction, roadmap and integrated planning, management and replication of Smart City projects</strong>&lt;br&gt;Bernard Gindroz – CEN CENELEC&lt;br&gt;Judith Borsboom-van Beurden – NTNU</td>
</tr>
<tr>
<td>12:00 – 12:50</td>
<td>Interactive brainstorming session&lt;br&gt;Moderated by Bernard Gindroz &amp; Joachim Lonien</td>
</tr>
<tr>
<td>12:50 – 13:00</td>
<td>Wrap up and Next steps&lt;br&gt;Simona Costa &amp; Georgi Georgiev</td>
</tr>
</tbody>
</table>
CEN Standard
Sustainable Energy Retrofit Process Management for Multi-Occuancy Residential Buildings with Owner Communities
Market demand & interested stakeholders

Georgi Georgiev
Sofia, 27.6.2018

Auf Wissen bauen

AKUSTIK
ENERGIEEFFIZIENZ UND RAUMKLIMA
GANZHEITLICHE BILANZIERUNG
HYGROTHERMIK
MINERAL, WERKSTOFFE UND BAUSTOFFRECYCLING
UMWELT, HYGIENE UND SENSORIK
Energy consumption by sector

- Transport: 33%
- Industry: 26%
- Buildings: 38%
- Agriculture: 2%
- Other: 1%

36% Greenhouse gas emissions
EU’s targets for 2020 and 2030

- Building renovation is a key element in reaching the long-term energy and climate goals.

- The building sector is considered as a key factor in all EU’s energy, climate and resource efficiency related strategies by 2050.
Documents related to improvements in energy energy performance of Europe's building stock

- Energy Performance of Buildings Directive (EPBD),
- Energy Efficiency Directive (EED),
- Renewable Energy Directive (RED),
- Eco design Directive,
- Energy Labelling.
Renovation rates in the EU

- Renovating the existing building stock remains a challenge,
- Ambitious levels set by the EPBD aims for nearly zero-energy buildings (nZEBs),
- Retrofit process is not a common practice today,
- Key objective: increasing the rate of sustainably functioning existing residential buildings.

<table>
<thead>
<tr>
<th>Expected rate</th>
<th>Current rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3%</td>
<td>0.2%</td>
</tr>
</tbody>
</table>

0 1 2 3 4 5
The difficulties of owner-occupants in reaching collective decision on renovation and improving energy efficiency appears as a problem,

Levels of refurbishment in apartment blocks are often lower than in single-family houses complexity of reaching agreement and involvement of different stakeholders.

Picture source: www.downloadclipart.net
Market demand - the challenges

- Lack of a *standardized process management* methodology for the energy retrofit of existing multi-occupancy residential buildings with owner communities,

- Lack of a *standardized quality management* methodology before, during and after retrofit process of existing multi-occupancy residential buildings with owner communities.
Relevant stakeholders

- Homeowner association,
- Owner communities,
- Property managers,
- Administrative advisory boards,
- Planners,
- Municipal consulting units,
- Energy advisors and
- Policy makers.
Creating the EU Standard

A legal framework would be helpful to establish:

- Obligations and responsibilities,
- Requirements for retrofitting,
- Rights and privileges of owners of apartments and
- Rights and privileges of all linked stakeholders.
SMARTER TOGETHER

Improvement retrofit strategy
for existing multi-occupancy residential buildings with Owner communities

Georgi Georgiev
Climate protection goals of the German Federal Government

- Climate neutral building stock until 2050 through -80% Primary energy demand

- In order to reach this goal we need an annual retrofit rate of 2%
Status quo

- Current annual retrofit rate of almost 1%

Non-retrofitted building stock according to the ownership form

- WEG: 69.3%
- Einzeleigentümer: 54.9%
- Wohnungsunternehmen: 52.7%
- Wohnungsgenossenschaften: 43.1%

Source: InWis, own graphics

- Annual retrofit rate of multi-occupancy residential = only 0.6-0.7%
Importance of the OC-blocks for the living space market

Number of the living units according to the ownership

- Privatperson: 23,728,707 (58.5%)
- WEG: 8,956,434 (22.1%)
- Wohnungsunternehmen: 5,158,853 (12.7%)
- Wohnungsgenossenschaften: 2,086,456 (5.1%)
- Sonstige: 614,867 (1.5%)

Source: Zensus 2011, own graphics
Why is the OC building stock improvement so complex?
Process of planning and execution of the retrofit

- Duration of the decision process – usually 2-3 years
Most important hurdles according to the owners

<table>
<thead>
<tr>
<th>Issue</th>
<th>Umfrage W.i.E</th>
<th>Studie BBSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alter</td>
<td>30%</td>
<td>28%</td>
</tr>
<tr>
<td>Passive Eigentümer</td>
<td>31%</td>
<td>-</td>
</tr>
<tr>
<td>Kein Eigenkapital vorhanden</td>
<td>-</td>
<td>31%</td>
</tr>
<tr>
<td>Kein Kredit möglich</td>
<td>14%</td>
<td>13%</td>
</tr>
</tbody>
</table>
Crucial drivers according to the owners

<table>
<thead>
<tr>
<th></th>
<th>Umfrage W.i.E</th>
<th>Studie BBSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Werterhaltung</td>
<td>86%</td>
<td>67%</td>
</tr>
<tr>
<td>Sowieso Sanierungsbedarf</td>
<td>48%</td>
<td>51%</td>
</tr>
<tr>
<td>Energieeinsparung</td>
<td>44%</td>
<td>60%</td>
</tr>
<tr>
<td>Erhöhung Wohnkomfort</td>
<td>39%</td>
<td>57%</td>
</tr>
</tbody>
</table>
The retrofit concept

A retrofit object: OC-building with 21 living units
Determination of the owners’ expectations
- Questionnaire action among the owners

1. Die folgenden Motive veranlassen mich eine energetische Sanierung durchzuführen.

<table>
<thead>
<tr>
<th>Motive</th>
<th>Trifft nicht zu</th>
<th>Trifft eher nicht zu</th>
<th>Trifft eher zu</th>
<th>Trifft voll zu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Einen Beitrag zum Klimaschutz leisten</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Steigerung des Wohnkomforts</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Energiekosten einsparen</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Werterhaltung der Immobilie</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Sonstige</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

2. Die folgenden Umstände stören mich bei der Nutzung der Wohnung.

<table>
<thead>
<tr>
<th>Umstände</th>
<th>Trifft nicht zu</th>
<th>Trifft eher nicht zu</th>
<th>Trifft eher zu</th>
<th>Trifft voll zu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probleme beim Öffnen und Schließen der Fenster</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Zugluft bei geschlossenem Fenster</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Kalte Wände</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Aussehen der Außenfassade</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Schimmelbildung</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Energiekosten</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Sonstige</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
RETROFIT OPTIONS

Variante 1
Geringster Aufwand
Niedrige Kosten

- Innendämmung 12cm
- Dämmung Kellerdecke 14cm
- Neue Verglasung
- Solarthermie 70m²

Variante 2
Sanierung mit Gerüst
Mittlere Kosten

- Außendämmung 16cm
- Dämmung Kellerdecke 14cm
- Neue Verglasung
- Solarthermie 50m²

Variante 3
Komplettsanierung
Hohe Kosten

- Außendämmung 16cm
- Dämmung Kellerdecke 14cm
- Neue Fenster
- Solarthermie 50m²
- Dezentrale Lüftung mit WRG

Variante 4
Sanierung mit Gerüst
PV Stromerzeugung

- Außendämmung 16cm
- Dämmung Kellerdecke 14cm
- Neue Verglasung
- Solarthermie 50m²
- PV Anlage 20kWp
Calculation of the payback time according to the net present value method

<table>
<thead>
<tr>
<th></th>
<th>Variante 1</th>
<th>Variante 2</th>
<th>Variante 3</th>
<th>Variante 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investitionsumme</td>
<td>158.313,61 €</td>
<td>174.168,75 €</td>
<td>433.770,69 €</td>
<td>212.830,19 €</td>
</tr>
<tr>
<td>Energiekosteneinsparung</td>
<td>4.688,95 €</td>
<td>4.868,28 €</td>
<td>5.744,31 €</td>
<td>5.482,95 €</td>
</tr>
<tr>
<td>Zinssatz</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Energiepreissteigerung</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
</tr>
</tbody>
</table>

| Amortisationszeit in Jahren | 24,1 | 25,2 | 40,8 | 26,6 |

- Wahl der Variante 2
Comparison of the energy demand

- **Bestand**: 100% (94%)
- **Variante 1**: 100% (50%, 60%)
- **Variante 2**: 100% (53%, 61%)
- **Variante 3**: 100% (46%, 35%)

Heizwärmebedarf in kWh pro Jahr und m² Nutzfläche

Legend:
- EnEV
- TRN SYS
- WUFI Plus
Determination of the living comfort improvement by using a dynamic simulation
- Surface temperature at the windows in February

The graph shows the surface temperature in °C over time for different variants. The labels on the graph read 'Bestand', 'Variante 1', 'Variante 2', and 'Variante 3'.
Financing

Instandhaltungsrücklage
Reicht nicht aus

Sonderumlage
Kann nicht bezahlt werden

Einzelkredit
Keine Bewilligung durch die Bank

Verbandskredit
Keine Zustimmung in der ETV

Energiespar-Contracting

Energieliefer-Contracting
Investitionsbereite Eigentümer können eine Energiegenossenschaft bilden, die als Contractor agiert
Vertical Redensification
Vertical redensification
At multi-occupancy residential buildings with owner communities
Potential of adding floors for multi-occupancy residential buildings with OCs

- **Total Potential**: 3.16 million
- **Buildings in regions with increased housing demand**: 1.72 million
- **Buildings after 1990**: 0.97 million
- **Buildings before 1950**: 0.62 million
  - **Buildings with OCs, 1950-1989, in regions with increased housing demand**: 0.35 million
- **Buildings in the central area**: 0.58 million
- **Primary potential of buildings for adding floors**: 0.58 million
Possibility of adding floors to buildings

<table>
<thead>
<tr>
<th>Type of vertical redensification</th>
<th>Penthouse floor</th>
<th>1 floor</th>
<th>2 floors</th>
<th>3 floors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential</td>
<td>60 to 90% of the building stock</td>
<td>85 to 90% of the building stock</td>
<td>35 to 45% of the building stock</td>
<td>2 to 5% of the building stock</td>
</tr>
<tr>
<td>Realization</td>
<td>A problem can be the load transfer in the existing support structure. A additional ceiling can be necessary.</td>
<td>Easy to realize, load transfer is difficult if there are complex support structures and roof shapes.</td>
<td>Expensive if the load reserves of the support structure are exceeded.</td>
<td>A exceed of the load reserves at buildings with under 5 floors is probable.</td>
</tr>
</tbody>
</table>

On average adding 1.3 floors per building is possible.
Adding floors depending on the legal factors

Adding 1.3 floors is acceptable according to the German law.
Construction costs and rental prices of added floors

Construction costs in € per m² living space

| 2 | 1.500 | 1.600 | 1.700 | 1.800 | 1.900 | 2.000 | 2.100 | 2.200 | 2.300 | 2.400 | 2.500 | 2.600 | 2.700 | 2.800 | 2.900 |

Rental prices in € per m² living space

| gef. | 7,0 | 7,5 | 8,0 | 8,5 | 9,0 | 9,5 | 10,0 | 10,5 | 11,0 | 11,5 | 12,0 | 12,5 | 13,0 | 13,5 | 14,0 |
Necessary basic rent for a return on equity of 4%.

Construction costs in €/m² living space

- Private investors, depreciation 2%
- Private investors, depreciation 2%, interest 0.5%
- Municipal companies
- Municipal companies, interest 0.5%
Possible extensions of buildings with an energetic retrofit

- Roof extensions
- Adding a floor
- Adding a penthouse floor
- Adding a floor with an overhang
Possible extensions of buildings with an energetic retrofit

building envelope
Load transfer through the existing ceiling

- stable existing ceiling
- reinforced existing ceiling
- new additional ceiling
- replacement of the existing ceiling
Load transfer through the walls

New walls on a new foundation

New walls on an existing foundation

Existing walls on an existing foundation

Existing walls on an existing foundation with reinforced structures
Fiancing through 1 additional floor construction

<table>
<thead>
<tr>
<th>Description</th>
<th>Area</th>
<th>Unit Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baukosten Aufstockung brutto</td>
<td>200 m² WF</td>
<td>2975 €/m²</td>
<td>595,000,00 €</td>
</tr>
<tr>
<td>Planungskosten 16%</td>
<td></td>
<td></td>
<td>95,200,00 €</td>
</tr>
<tr>
<td>Ablösung Stellplätze</td>
<td></td>
<td></td>
<td>16,800,00 €</td>
</tr>
<tr>
<td>Baukosten Sanierung Bestand brutto</td>
<td></td>
<td></td>
<td>377,000,00 €</td>
</tr>
<tr>
<td>Förderungen</td>
<td></td>
<td></td>
<td>203,000,00 €</td>
</tr>
<tr>
<td>Verkauf Wohnungen</td>
<td>200 m² WF</td>
<td>6000 €/m²</td>
<td>1,200,000,00 €</td>
</tr>
<tr>
<td>Gebühr Makler und Notar 4%</td>
<td></td>
<td></td>
<td>48,000,00 €</td>
</tr>
<tr>
<td>Gewinn</td>
<td></td>
<td></td>
<td>271,000,00 €</td>
</tr>
</tbody>
</table>
## Sanierungsfahrplan

- Zeitliche Aufteilung der Maßnahmen mit einem Sanierungsfahrplan, um finanzielle Belastungen zu senken

<table>
<thead>
<tr>
<th>Maßnahme</th>
<th>Zeitpunkt</th>
<th>Kosten</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modernisierung Heizkessel</td>
<td>Bereits erfolgt</td>
<td>32.000 €</td>
</tr>
<tr>
<td>Dämmung der Kellerdecke</td>
<td>Falls finanzielle Mittel vorhanden, so schnell wie möglich</td>
<td>25.000 €</td>
</tr>
<tr>
<td>Austausch der Verglasung</td>
<td>Falls finanzielle Mittel vorhanden, so schnell wie möglich</td>
<td>55.000 €</td>
</tr>
<tr>
<td>WDVS an Außenwand</td>
<td>Wenn Putzsanierung anfällt in ca. 10 Jahren</td>
<td>141.000 €</td>
</tr>
<tr>
<td>Solarthermieanlage</td>
<td>Falls finanzielle Mittel vorhanden, sonst bei Dacherneuerung</td>
<td>67.000 €</td>
</tr>
<tr>
<td>Alternativ: RKHW</td>
<td>Bei Heizkesselerneuerung in ca. 15 Jahren</td>
<td></td>
</tr>
<tr>
<td>Dezentrale Lüftungsgeräte mit WRG</td>
<td>Falls finanzielle Mittel vorhanden, sonst wenn Mindestluftwechsel nicht gewährleistet</td>
<td>84.000 €</td>
</tr>
</tbody>
</table>
### Festsetzung der Instandhaltungsrücklage nach dem Sanierungsfahrplan

<table>
<thead>
<tr>
<th>Jahr</th>
<th>Instandhaltungsrücklage</th>
<th>Auszahlung</th>
<th>Anlass</th>
<th>Einzahlung</th>
<th>Einzahlung pro m² Wohnfläche</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18.000,00 €</td>
<td>- €</td>
<td></td>
<td>15.880,00 €</td>
<td>10.88 €</td>
</tr>
<tr>
<td>2</td>
<td>33.880,00 €</td>
<td>20.000,00 €</td>
<td>Kellerdecke</td>
<td>15.880,00 €</td>
<td>10.88 €</td>
</tr>
<tr>
<td>3</td>
<td>29.760,00 €</td>
<td>- €</td>
<td></td>
<td>15.880,00 €</td>
<td>10.88 €</td>
</tr>
<tr>
<td>4</td>
<td>45.640,00 €</td>
<td>44.000,00 €</td>
<td>Verglasung</td>
<td>15.880,00 €</td>
<td>10.88 €</td>
</tr>
<tr>
<td>5</td>
<td>17.520,00 €</td>
<td>- €</td>
<td></td>
<td>15.880,00 €</td>
<td>10.88 €</td>
</tr>
<tr>
<td>6</td>
<td>33.400,00 €</td>
<td>- €</td>
<td></td>
<td>15.880,00 €</td>
<td>10.88 €</td>
</tr>
<tr>
<td>7</td>
<td>49.280,00 €</td>
<td>- €</td>
<td></td>
<td>15.880,00 €</td>
<td>10.88 €</td>
</tr>
<tr>
<td>8</td>
<td>65.160,00 €</td>
<td>- €</td>
<td></td>
<td>15.880,00 €</td>
<td>10.88 €</td>
</tr>
<tr>
<td>9</td>
<td>81.040,00 €</td>
<td>- €</td>
<td></td>
<td>15.880,00 €</td>
<td>10.88 €</td>
</tr>
<tr>
<td>10</td>
<td>96.920,00 €</td>
<td>112.800,00 €</td>
<td>WDVVS</td>
<td>15.880,00 €</td>
<td>10.88 €</td>
</tr>
<tr>
<td>11</td>
<td>- €</td>
<td>- €</td>
<td></td>
<td>15.880,00 €</td>
<td>10.88 €</td>
</tr>
</tbody>
</table>

- Monatliche Einzahlung für eine 80m² Wohnung: 73€
Darstellung der Informationen für die Eigentümer

Aufwandswanddämmung WDVS

- Mineralwolle-Dämmplatten
  16cm WLG 035
  Kalk-Zement Oberputz
  Inklusive Gerüstkosten

- Kosten: 141.000€
  - Große Energieinsparung
  - Vermeidung der meisten Wärmebrücken
  - Gerüst benötigt
  - Neue Attika benötigt

Sanierungsvariante 2 WDVS + Solarthermie

- KfW Effizienzhaus 100
  Qp = 58,7W/m²K

- Maßnahmen
  - WDVS Außenwände
  - Erneuerung Attika
  - Erneuerung der Fensterverglasung
  - Dämmung der Kellerdecke
  - Erneuerung der Hauseingangstüren
  - Ersetzen der Glashausteine durch Fenster
  - Solarthermie 50m²
  - Planung

- Förderungen
  - KfW
  - FES München
  - BAFA
  - Smart City

- Energieeinsparung
  4900€/Jahr
  25 Jahre

- Nutzerkomfort
  - Steigerung der Behaglichkeit in den Wohnungen durch höhere Oberflächentemperaturen
  - Erhöhung der Temperatur im Treppenhaus
  - Verschönerung des Erscheinungsbildes der Fassade
Conclusion

- The active owners’ participation from the very beginning of the process is crucial for the success, in order to know the exact needs and expectations.

- The dynamic simulation can visualize another aspects of the retrofit and by this help during the decision making.

- Alternative financing methods enable the financing without direct payments by the owners are needed.

- Cascade retrofit planning enables the proper financial planning for the OC.
European Union has set ambitious targets for CO$_2$ reduction.

Also Sofia aims at reducing CO$_2$ by 20% until 2020*.

The CO$_2$ source today in focus:

Owner Community Buildings

In Munich similar target setting, with a specific program to improve energy efficiency of buildings.

Within H2020 Smarter Together the goal is to share experiences with follower cities like Sofia.
CO₂ Reduction has two levers

Quantity = Number of buildings improved

×

Quality = Intensity of energy reduction per building

- CO₂
Quantity = Number of buildings improved

- You need to **inform many** through various channels
- You need to **contact many** in person
- Show them the **advantages** of energetic building retrofit
- **Convince** the decision makers with facts
- Coach and support the process of **decision making**
Select the most promising buildings for retrofit based on reference building typology

Offer a smart set of technical measures (e.g. facade, window, roof, cellar, PV, smart metering)

Support planning and implementation with a quality management

Monitor the actual saving effects and adjust early enough
Munich gathered **information** on reference types of buildings in the city.

Munich narrowed down few **specific districts** in which retrofit provides potentially high CO₂ reduction impact.

Munich set up an **organisation** for energy retrofit with own staff („MGS“).

Munich installed local **contact offices in the districts** to get in contact with citizens and offer information on energy retrofit.
Specific events for citizen involvement have been organised to get people’s feedback and new insights.

Pulling together a team of functional experts to come up with new solution options already in an early stage:
- Technical building experts (Energy check)
- Experts with overview on public funding options
- Experts for calculating financial effects (financing volume, risk, payback time)
- Experts for setting up innovative financing options (e.g. crowd funding, energy communities)

Experience exchange with other cities
Decisions on building retrofit take time

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness</td>
<td>Contact, E-Check</td>
<td>Decision process</td>
<td>Refurbishment</td>
<td>Monitoring</td>
</tr>
</tbody>
</table>

Owner communities have slow and tedious decision making processes that must not be underestimated in the timeline.

Thus, the invest in the early stages (Awareness, Contact, E-Check, Decision Process) is important and crucial for success.
How Smarter Together can support Sofia

1. Develop a strategic roadmap for building efficiency improvements

2. Develop a guideline to optimally allocate public funding and establish a funding policy

3. Support and sparring in setting up local building retrofit coordination entities (similar to MGS)
Examples from Munich
Challenge in Munich is the owners structure of the buildings.

Owners corporations (OC) represent an large number of individuals (up to 300).

Decisions for energetic upgrade are made by the OC-assembly.

Energetic upgrades have 10-20 years impact on cost, ease and comfort.

Decisions must be made under great uncertainty on future developments.

Static calculations based on historic figures give only few indications.

With Dynamic Decision Management we have a way to...

- Deal with uncertainty and risk better than before
- Include many influencing factors
- Integrate ranges in which the influencing factors may vary in the future
- Integrate cross-effects of influencing factors

- And finally... Find the most probable corridor in which the integrated effects of all factors will be...
Many influencing factors

Financial evaluation of energetic upgrades

- Impact of users' behaviour on energy consumption
- Personnel cost for maintenance and investments
- Materials cost for maintenance and investments
- Price level for electric energy
- Price level for heating energy (gas, oil, wood...)
- Quality of actual work to implement the planned improvements
- Quality and precision of cost estimations for maintenance
- Quality and precision of cost and timing estimations for investments
We don’t know... so we put ranges
And agree on assumptions

Example: Gas Price Development

1. We assume the gas price to rise in average and we thus expect that the actual price in the respective year in the future can vary up to 30% up and down around that average value.

2. We also assume, the gas price will never go lower than 90% of today’s value and never be higher than twice as high as today.
Impact factors decision making process

Invariable constraints
- Owner constraints
  - Age
  - Financial resources
  - Owner-occupant or landlord
- Building constraints
  - Size of the building
  - Age and construction value
  - Damages
- LAV constraints
  - Majorities for resolutions
  - Declaration of division
  - Condominium act
  - Technical provisions

Variable factors by the retrofit concept
- User comfort / building physics
  - Energy saving
  - Carbon dioxide avoidance
  - Thermal comfort
  - Acoustic comfort
  - Hygrothermal comfort
  - Damage avoidance
- Process sequence
  - Motivation of the parties
  - External parties
  - Duration of the processes
  - Disturbances in the building phase
- Profitability
  - Investment costs
  - Energy cost reduction
  - Value retention
  - Subsidies
  - Rent increase
  - Financing
- Communication
  - Technical explanations
  - Communication channels
  - Property management
  - Information material
  - Contest of the climate change

Fraunhofer IFF
Münche
### Retrofit Process

#### Process Steps

<table>
<thead>
<tr>
<th>Stage 1: Information Collection</th>
<th>Stage 2: Planning and Conceptual Design</th>
<th>Stage 3: Detailed Design and Construction</th>
<th>Stage 4: Commissioning and Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collect data from different sources</td>
<td>Develop conceptual designs</td>
<td>Develop detailed designs</td>
<td>Perform final testing and commissioning</td>
</tr>
</tbody>
</table>

#### Key Activities

- **Stage 1:**
  - Collect data from different sources
  - Identify potential retrofit areas

- **Stage 2:**
  - Develop conceptual designs
  - Determine feasibility and costs

- **Stage 3:**
  - Develop detailed designs
  - Obtain necessary permits and approvals

- **Stage 4:**
  - Perform final testing and commissioning
  - Ensure compliance with regulations

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IBSE
Processes of the impetus phase

1. Idea of the retrofit
   - Of the owners
   - Of the property management
   - At periodic house inspections

2. Obtain information
   - In the district service center (Stadtteiladen)
   - At homeowner associations
   - At consumer advice centres

3. Collect first retrofit options
   - Commissioning an energy advisor for a building
   - Using Online Tools to plan retrofit options

4. Participation of all owners
   - Interview other owners about the retrofit
   - Organise an information evening
   - Distribute information material
   - Explanation of the further procedure
   - Explain planned resolutions in the OC assembly

5. 1st OC assembly
Retrofit concept co-creation process

- blueprints
- owner surveys

creations of retrofit options

- construction process plan
- WUFI simulation
- TRNSYS simulation
- EnEV calculation
- cost calculation

- disturbances of the owners
- building physics constraints
- energy saving
- subsidies
- investment cost

- user comfort
- profitability

- retrofit concept
# Retrofit Roadmap: Case Study Munich

<table>
<thead>
<tr>
<th>Retrofit Measure</th>
<th>Time</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retrofit the heating boiler</td>
<td>As fast as possible</td>
<td>Already done</td>
</tr>
<tr>
<td>Insulate the cellar ceiling</td>
<td>As fast as possible</td>
<td>25,000 €</td>
</tr>
<tr>
<td>Retrofit the windows or glazing</td>
<td>If a repair is needed</td>
<td>315,000 €</td>
</tr>
<tr>
<td>Insulate the exterior wall</td>
<td>If a repair of the plaster is needed</td>
<td>141,000 €</td>
</tr>
<tr>
<td>Cogeneration or solar plant</td>
<td>Depending on energy costs and subsidies</td>
<td>67,000 €</td>
</tr>
<tr>
<td>Decentralized ventilation units with heat recovery</td>
<td>If the required fresh air flow rate is not provided</td>
<td>84,000 €</td>
</tr>
</tbody>
</table>

**KfW 100**

**KfW 85**
Thank you for your attention!

georgi.georgiev@ibp.fraunhofer.de
Joachim Lonien
DIN
Joachim.Lonien@din.de
Kick-off of the CEN Workshop Agreement CWA
Sustainable energy retrofit process management for multi-occupancy residential buildings with owner communities

Joachim Lonien, DIN
- for Stefanie Müller and Christian Grunewald (DIN)
Agenda

- Introduction of the **CEN Workshop Agreement** concept
- Background of the CEN Workshop proposal
- Establishment of the CEN Workshop
- Activities of the CEN-CLC-ETSI Sector Forum on Smart and Sustainable Cities and Communities
- Working on CWA content (interactive session)
- Next steps and closing of meeting
CEN Workshop Agreements

Working rules
European Standardization Organizations (ESOs)

CEN (European Committee for Standardization)

CENELEC (European Committee for Electrotechnical Standardization)

ETSI (European Telecommunications Standards Institute)
About CEN

34 National Standardization bodies
About CEN

- Provides a platform for stakeholders to come together and reach a consensus at European level.

- We help to ensure that the system respects the WTO principles of transparency, openness, coherence, consensus.

- Support established Technical Bodies in the development of their standardization/pre-standardization deliverables.
CEN Deliverables

✓ Produced in **Technical Committees** with national delegations:
  - European Standards – EN
  - Technical Specifications - CEN/TS
  - Technical Reports - CEN/TR

✓ Produced in **Workshops** with individual interested parties:
  - CEN Workshop Agreement - CWAs
CEN Workshop concept

✓ **Flexible** working platform:
  • Light procedures
  • **Direct and voluntary participation of stakeholders**
  • Participants decide on the working arrangements

✓ **Open** to any company or organization:
  • **Inside or outside Europe**
  • Public process

✓ **Rapid** elaboration of **documents**
  • Few physical meetings
  • Work by electronic means encouraged
CEN Workshop Agreement (CWA)

- Final deliverable of the Workshop - **Voluntary application**
- Content: technical specifications, guidance material, best practice, information, etc.
- They can be the basis for an European or international standard at a later stage
- **CEN IPR policy and exploitation rights** are applicable to CWAs (registration form)
Initiators

Who are the initiators? Anyone can initiate!

• Industry
• Public authorities
• Professional organisations, Federations
• Research projects
• Academics – Universities, etc.
General process

- Proposal to CCMC
- Announcement on Website with the Project Plan
- KO meeting – approval of the Project Plan
- CWA development
- Possible public consultation
- Consensus on comments and update of CWA
- CWA approval by the WS
- Publication by CCMC
Project plan

CEN/WS “Sustainable energy retrofit process management for multi-occupancy residential buildings with owner communities”

In the framework of the EU Smart City Project SMARTER TOGETHER, this Workshop will develop a CEN Workshop Agreement (CWA) which will describe a workflow and an overall quality and process management methodology for the resource efficient retrofit of existing multi-occupancy residential buildings with owner communities. The target group of the standard are all relevant process stakeholders including owner communities, property managers, owner community boards, planners, energy efficiency consultants, and policy makers.

The kick-off meeting and first plenary will be held on 27 June 2018 in Sofia, Bulgaria.

Participation in the Workshop is free of charge and open to anyone.

All interested parties are welcome to register for participation and submit comments on the draft Project Plan to the Workshop Secretary Stefanie Müller.

Download the documents:

> Project Plan (pdf format)
> Project Plan’s commenting form (word format)
> Kick-off meeting agenda (pdf format)
## Development process

<table>
<thead>
<tr>
<th>Project Plan</th>
<th>Kick-off Meeting</th>
<th>CWA drafting &amp; adoption</th>
<th>Publication of CWA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Describing</strong></td>
<td><strong>Confirming</strong></td>
<td><strong>Consensus Process</strong></td>
<td><strong>Validity of 3 years</strong></td>
</tr>
</tbody>
</table>
| - Scope  
  - Objectives  
  - Schedule  | - Project Plan  
  - Rules of the Workshop  
  - Chairperson  
  - Secretariat  | - Workshop participants  
  - Public consultation where required  | - Re-confirmation possible only once |

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Open Consultation Phase

- Mandatory if the CWA deals with safety aspects

- Highly recommended for all Workshops → increase transparency

- Draft CWA text posted at CEN website

- Duration: minimum 60 days
CEN Workshop Agreement

- Can be technical specifications, guidance material, best practice, information, etc.

- The results are purely voluntary in application

- No obligation for CEN Members to withdraw any conflicting national standards

- CWAs are not designed in principle to give ‘presumption of conformity’ to a EU Directive

- However they can be developed in the context of a request for standardization from EC or a Directive
Kick-off meeting

- Invitation of interested stakeholders
- Accept the Business Plan
- Ensure there is sufficient support → no conflicting standards or NWIP
- Confirm the Chair
- Confirm the financial resources are secured
- Confirm the Secretariat – a CEN Member
Development of the CWA

- Work according to the rules decided by participants during the kick-off meeting
- Ongoing improvement process of the documents
- Public enquiry – not mandatory (but advisable). Needed when Commission funding or safety matters
Workshop Participants

Participation in Kick-off Meeting ≠ Participation in the Workshop

✓ Conditions of participation in Workshop:
  • Signature of Registration Form
  • Agreement to assign exploitation rights of individual contributions to Workshop deliverables to CEN
  • Registration to Workshop can be done at any time until the end of the drafting phase

✓ Role of Workshop Participants:
  • Providing comments and input on draft documents
  • Approval of the CEN Workshop Agreement (organisations approving CWA will be listed in WA foreword)
Publication

- Announcement in CEN Members’ catalogues
- CEN/CENELEC retains the intellectual and exploitation rights on the CWA
- Promotion in the 34 countries member of CEN/CENELEC
- Companies/organizations endorsing the CWA are listed
CWA and Lifetime

Valid for 3 years, after which the participants are asked to make a choice to:
- reconfirm
- revise
- upgrade into a standard/ technical specification
- withdraw

Max. 6 years!
Structure of a CWA

- Foreword
- Introduction
- Scope
- Normative references
- Terms and definitions
- Requirements and recommendations
- Informative annex
- Bibliography
Livelink – Electronical committee

- Web-based access
- Documentation of all Workshop related exchanges
- Voting booth
- Discussions
- Task lists
- Access rules
  - Collection of contact details
  - Signing participant registration form, incl. assignment of exploitation rights
Background of the CEN Workshop proposal
As far as it can be judged from DIN there is currently no standard or project in the work program of the relevant TCs for the planned scope of the CWA “Sustainable Energy Retrofit Process Management for Multi-Occupancy Residential Buildings with Owner Communities”.

Nevertheless, it has to be checked if the scope of the planned CWA overlaps with a work item with the title “Valuation of Energy Related Investments” which will be eventually taken up into the work program of the CEN/CLC/JTC 14 and if the degree of standardizability of this topic is sufficient.

Remark: If the CWA covers cost calculations which include LED lightning, it has to be taken into account that due to non-visual effects on humans, proper LED lightning is not yet available at the market. This influences the accuracy of the cost calculations.
“This document provides a description on how to gather, calculate, evaluate and document information in order to create solid business cases for industrial, governmental or private energy related investments (ERIs). [..] Intended is that this standard meets the needs of all protagonists of an ERI.”
Establishment of each CEN Workshop
Workshop Chairperson

- Presides at Workshop plenary meetings
- Ensures Workshop delivers the agreement in line with its Project Plan
- Manages the **consensus building process**
  - Decides when the Workshop participants have reached agreement on the final CWA, on the basis of the comments received
- Interface with CEN-CENELEC regarding strategic directions, problems arising, external relationships, etc.
- Ensures due information exchange with the Workshop Secretariat
Workshop Secretary

- Formally register Workshop participants and maintain record of participating organizations and individuals
- Offer infrastructure and manage documents and their distribution through the electronic platform
- Prepare agenda and distribute information on meetings and meeting minutes/follow up actions
- Initiate and manage CWA approval process upon decision by the Chairperson
- Advise on CEN rules and bring any major problems encountered (if any) in the development of the CWA to the attention of CCMC
Establishment of Workshop

- Appointment of Chairman
- Appointment of Vice Chair
- Confirm the Workshop Secretariat
- Discussion of the Project Plan
- Approval of the Project Plan
Discussions within the CEN Workshop
Next steps and closing of meeting
Summary and next steps

- Short summary of discussions
- Organization of the further work
- Planning of the meetings, follow-up actions
- Any other business
- Closure of meeting
Next steps

- Include session outcomes to an initial draft
- 1\textsuperscript{st} Web conference
- 2\textsuperscript{nd} Physical meeting
- 2\textsuperscript{nd} Web conference
- Draft CWA by
- Web conference / physical meeting to finalize CWA in December (?)
Thank you for your attention!

Your project managers:

René Lindner  
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Standardization work in support of Smart & Sustainable Cities

Dr. Bernard GINDROZ

Chair ISO TC 268 « Sustainable Development in Communities »
Chair CEN/CENELEC/ETSI SF Smart & Sustainable Cities and Communities
Smart and Sustainable Cities developments

Complex Challenges but Great Opportunities ➔ Long term vision and commitment ➔ Holistic approach, priorities ➔ Integrated planning, ➔ Citizens’ engagement ➔ Culture of results

Standardization from best practices and innovative models/partnership in support of:

• Replication
• Business models
• Dissemination
Smart and Sustainable Cities developments

Need for:
• Appropriate legislative and RDI frameworks
• Support to pilot and demo for replication and scaling-up
• National engagement
• New models of Partnership

• Standardization to help harmonization and de-risk decision making and investment
Context & Challenges faced by cities

• By 2050, the population is forecast to be just under 10 billion people, with about **80%** of that population expected to be **urbanized**.

• The **challenge** that every city is facing is how to best deliver the **resources and services** needed to ensure a **thriving population** and **good economic performance**.

THE GLOBAL CONTEXT

Cities today occupy approximately **only 2%** of the total land, however:

- **70%** Economy (GDP)
- **Over 60%** Global Energy Consumption
- **70%** Greenhouse Gas Emissions
- **70%** Global Waste
Sustainable Development Goals

Common challenges and engagement

Committed by all Member States and EFTA and the European Commission’ strategies
ISO Smart and Sustainable Cities developments

*Smart Cities require a holistic approach for sustainable development...*

- Challenges faced by Cities are very complex and multidimensional, multisectorial.
- Big challenge is to develop comprehensive policies, consistently applied over different municipal areas.
- A focus on citizens with new governance models
- 5 major areas of priorities with dedicated KPIs:
  1. People
  2. Planet
  3. Prosperity
  4. Governance
  5. Replication/scaling-up-Dissemination
Smart and Sustainable Cities developments

- Vision (incl. results related)
- Commitment/Decision
- Strategy with objectives
- Sectorial/area Roadmaps with targets

**Implementation and culture of results**
- Measure progress and monitor
- Evaluate against planned targets
- Improve to meet the objectives
- Communication & reporting

*Implementation-Pilot-Demo*
ISO TC 268 Sustainable cities and communities

Based on local context with long term targets, considering:
- Quality of life for all citizens
- Economic development
- Environmental & Climate change issues

Quality Management throughout the whole process
ISO TC 268 Sustainable cities and communities

The proposed series of International Standards will encourage the development and implementation of holistic and integrated approaches to sustainable development & sustainability.

Participating countries: 36
Observing countries: 22

Secretariat: AFNOR, Mr. Etienne Cailleau
Chairman: Dr. Bernard Gindroz
Creation date: 2012

TC 268 contributes to the UN Sustainable Development Goals through its standardization work.
ISO TC 268 Sustainable cities and communities

1. DECISION/COMMIT (Strategy)
2. PLAN (roadmap & targets)
3. DO (Implementation)
4. CHECK (against targets)
5. ACT (Correct)

→ Terms and Definitions
→ Description of cities
→ Strategies for long term vision
...to help decision/commitment

→ Multi sectorial Strategies for cities
→ Targets with Indicators
...to help setting roadmaps with targets

→ Identify infrastructures issues
→ Identify multisectorial issues
→ Set Indicators for progress follow-up and reporting
...to help implementing the roadmaps/actions plans

→ Measure progress towards planned targets
...to evaluate the results of the actions

Diagnostic of city’s « readiness level » (maturity)
...for setting a long term vision

Management & governance, and guidelines
ISO Smart and Sustainable Cities developments TC 268

Organisation

ISO/TC 268 Ad-hoc Group
« good practices of cities » in support of ISSCC

ISO TC 268 TG
Smart Cities services

ISO/TC 268/WG 1
Management System Standards

ISO/TC 268/WG 2
City indicators

ISO/TC 268/WG 3
City anatomy and sustainability terms

ISO/TC 268/WG 4
Strategies for smart cities and communities

ISO/TC 268/SC 1/TG 1
Roadmap

ISO/TC 268/SC 1/TG 2
Pilot Testing

ISO/TC 268/SC 1/WG 1
Infrastructure metrics

ISO/TC 268/SC 1/WG 2
Integration and interaction framework for smart community infrastructures

ISO/TC 268/SC 1/WG 3
Smart transportation

ISO/TC 268/SC 1/WG 4
Data exchange and sharing for smart community infrastructures

CEN/CENELEC/ETSI
SSCC-SF

ISO/TMB/SSCTF

ISO-IEC/JTC1 WG 11

IEC/SysC
ISO Smart and Sustainable Cities developments TC 268
Organization – suggestion for specific contexts

Application guidelines for the implementation ISO 37101
- In specific areas and/or sectors
- With set of relevant related KPIs

ISO/TC 268 Sustainable Development in cities

ISO 37101 standards
ISO 37104 guidelines

ISO/TC 268 WG 1 Management System Standards

Specific application guidelines
- Small & Medium size cities
- Business Districts
- Airports/harbours
- Other.....
At European Level

Sector Forum on Smart and Sustainable Cities and Communities (SF-SSCC)

Dr. Bernard GINDROZ - Chairman

SERVING THE CITIES’ NEEDS
Standardization activities in support of smart and sustainable cities and communities

CEN/CENELEC/ETSI Sector Forum
Smart and Sustainable Cities and Communities
CEN/CENELEC/ETSI Sector Forum SSCC

- Sector Forum created in 2017
- As a horizontal strategic and advisory body on smart & sustainable cities and communities
- 2 plenary sessions per year
- 1 annual seminar
- Permanent representation in the European Innovative Partnership initiative from the European Commission (Smart Cities and Communities – EIP SCC - )
- Permanent representation of EIP AHA through AGE Platform
- Permanent participation of the European Commission
CEN/CENELEC/ETSI Sector Forum SSQC

- provide a **platform for exchange** of information **between cities and all concerned stakeholders**, including citizens; national contexts & local org

- provide **support and guidance** to the relevant standardization technical bodies, essentially on horizontal or cross-sectorial matters;

- **coordinate and advise** on standardization activities relevant to the cities and the sector, **in close relation with cities and communities, EU legislative and RD&I frameworks for complementarity**

- consider where **further standardization work is needed within the sector.**
CEN/CENELEC/ETSI Sector Forum SSCC

- Collect and coordinate expectations expressed in the EIP SCC and EIP AHA by smart and sustainable cities related and relevant stakeholders and inform them about on-going and new standardization development

- Motivate cooperation/partnership, replication and scaling-up

- Share national views and position about international standardization development (ISO, IEC, ITU) in support of the cities and major commitment (such as UN SDGs)

- Make recommendation about adoption of international standards (ISO, IEC, ITU) at European level
CEN/CENELEC/ETSI Sector Forum SSCC

Annual event

• First one last October 19th in Brussels, co-organized by European Commission and CEN/CENELEC/ETSI - about 150 participants
• Share challenges and major issues faced by cities and communities
• Collect expression of needs from cities and communities
• Identify topics where improvement are needed, as well as standardization development is relevant

→ CEN/CENELEC/ETSI SF SSCC as Single Entry point (Reference) in standardization for Smart & Sustainable Cities and Communities in Europe
CEN/CENELEC/ETSI Sector Forum SSCC

On-going work - in line with outcomes from the annual event

» Mapping challenges faced by cities for smart and sustainable development

» Mapping existing initiatives & standardization development

» Exchanges with Cities’ reps (i.e. Cities, national associations of cities, local/Regiona/National/EU authorities) and collecting expression of needs for standardization development

» Integration of societal priorities in SSCC consideration

» Integration of citizens’ needs – co-creation
Conclusions and perspectives

- Smart & Sustainable development a real challenge for cities
- A need for holistic approach & New governance models
- A culture of results with permanent improvement approach
- A culture of communication and reporting to keep collective engagement
- A need to exchange experiences and learn from successful initiatives
  - Cities’ and citizens’ representatives in mirror committees
- Standards are key enablers and practical implementation guidelines necessary to successful implementation
  - Please feel free to contribute and participate
Questions & Answers
Dr. Bernard GINDROZ

gindrozb@bmgi-consulting.com
Phone: +33 623 22 19 37
European framework of vertical and horizontal actions

- **Citizen Focus**: How we include citizens into the process as an integral actor for transformation.
- **Policy & Regulation**: Creating the enabling environment to accelerate improvement.
- **Integrated Planning**: How we work across sector and administrative boundaries; and manage temporal goals.
- **Knowledge Sharing**: How we accelerate the quality sharing of experience to build capacity to innovate and deliver.
- **Metrics & Indicators**: Enabling cities to demonstrate performance gains in a comparable manner.
- **Open Data**: Understand how to exploit the growing pools of data; making it accessible – yet respecting privacy.
- **Standards**: Providing the framework for consistency, commonality, and repeatability, without stifling innovation.
- **Business Models, Procurement & Funding**: Integrating local solutions in an EU and global market.
European Innovation Partnership Smart Cities and Communities

6 Action Clusters

4600 partners, 370 commitments, 31 countries.

Integrated Planning Policy & Regulation
General roadmap

- Fragmented Smart Cities market
- Gap analysis
- Strategic Implementation Plan
- 4000 partners in 370 commitments
- Scaling up successful commitments
- Growing the community
- Smart city ecosystems for replicable high impact solutions
Why is integrated planning important?

In day-to-day policy and decision-making by city administrations and urban stakeholders, coordination-related issues need to be addressed for successful implementation:

- to develop a holistic perspective on low energy neighbourhoods, integrated infrastructures, clean urban mobility and ICT – district level more than collection of buildings
- to frame the impact of short term actions within a longer time horizon and long term goals and to measure progress – choose solutions with best value for money and prevent “lock-ins”
- to organise cross-domain collaboration during preparation and implementation of plans – prevent delay of implementation due to siloes
- to enable governance of co-design and co-creation processes with a wide variety of urban stakeholders who are often interdependent upon each other for results – ensure collaboration of stakeholders and co-financers
- to mobilise capital from different sources to finance projects at an early stage – prevent cancellation of plans due to lack of finance
- to accelerate the impact of smart city projects towards urban transition – go beyond urban acupuncture
Common achievement of the action cluster

Co-create a **Smart City Guidance Package (SCGP)**, which

- is written in simple straight-forward language
- bundles experiences of cities
- helps other cities in avoiding common pitfalls, and in implementing their plans
- will eventually be a living document.

Publication at event in Autumn 2018 (150 pages).

NTNU is leading this activity supported by the whole Action Cluster.
### For who? SCGP target audience

<table>
<thead>
<tr>
<th>Type of stakeholder</th>
<th>Who specifically</th>
<th>Use of SCGP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>European cities and their partners - preparing the next generation of implemented smart city projects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Follower cities, who have already built the competences and need to secure financing. They are the ideal partners to kick-off a pipeline of projects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Politicians and administration local government: mayor, alderman, city council</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide general information about process of smart city strategy preparation and implementation of plans, get everybody at level playing field. How to track progress and measuring impact. Help anchoring political commitment. Give ideas about how to organise the last mile to the bank. Show general approach to frame short term actions in long term goals (temporal coordination)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supporting staff as strategists and advisors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Show how to develop strategies and plans in an integrated, well-coordinated way, fitting in cities’ overall aims. Provide information on financial instruments and stakeholder engagement. Ideas for urban transition management</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operational level local government</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Directors of unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pave the road for realising specific project pipelines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raise awareness of context for planning and implementing technical measures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practitioners</td>
<td></td>
<td></td>
</tr>
<tr>
<td>References to specific methods and solutions, as well as obstacles and barriers</td>
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<tr>
<td>Project managers of Smart City strategies, plans and projects</td>
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<tr>
<td>Educate project managers, who usually have a background in traditional project management which does not equip them fully for smart city projects. Get everybody at level playing field: different backgrounds of project managers and staff in the follower cities, who come from different sectors as lighting, facility management, construction, real estate. SCGP can facilitate transfer of knowledge to follower cities by showing how to do integrated planning and implementation, and find a way to overcome often occurring difficulties. Information about problems and failures is as important as on best practices. Provide also basic information on other solutions than those tested in the lighthouse projects. Help developing the project further by showing the different phases and components.</td>
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<tr>
<td>Private or public partners involved as key players in preparation and implementation of a smart city plan, partners of cities interested in developing future smart city plans</td>
<td>Other local authorities e.g. water boards</td>
<td>Get everybody at level playing field in terms of understanding</td>
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<td></td>
<td>Owners and operators of transport and energy network operators, energy and transport providers, utilities network operators</td>
<td>Inform and involve public administration managers, such as energy providers, transport, etc. who are often responsible above the city scale, at regional level, for instance an energy grid manager, or partners providing energy</td>
</tr>
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<td></td>
<td>Owners of infrastructures, buildings and land</td>
<td>Get everybody at level playing field in terms of understanding. Provide information about methods for co-design and co-creation, and financial instruments</td>
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<tr>
<td></td>
<td>Housing associations, real estate developers</td>
<td>Inform about planning and implementation of technical solutions, engagement of end users as tenants or buyers and financial instruments.</td>
</tr>
<tr>
<td>Providers of technical solutions</td>
<td>Building and construction industry, ICT</td>
<td>Inform about possible coordination issues during integrated planning and implementation around technical solutions, and inform about engagement of stakeholders and end users</td>
</tr>
<tr>
<td>Consultancy and engineering</td>
<td>Advisors, architects, consultants, engineering</td>
<td>Provide general information about process of smart city strategy preparation and implementation of plans. Inform about technical and spatial coordination issues during integrated planning and implementation of technical solutions</td>
</tr>
<tr>
<td>Research and innovation partners</td>
<td>Research and Technology organisations, Universities</td>
<td>Provide general information about process of smart city strategy preparation and implementation of plans, as contextual information for methods and technologies.</td>
</tr>
<tr>
<td>(End)-users and owners of buildings and services</td>
<td>NGO’s Local businesses Citizens, tenants Interested citizens and local businesses Bottom-up initiatives</td>
<td>Find examples for stakeholder involvement through co-design and co-creation. They are the end-users ultimately, possibly also co-creators. How to develop a common operational picture with tenants and owners of buildings</td>
</tr>
</tbody>
</table>

Further existing, expanding projects, like FP7, EU Urban Agenda projects
Collaborative development: cities, businesses, research

- Input from workshops with commitments
- Desk Research H2020 SCC-01
- Project information, SCIS, European Energy Award
- Interviews lighthouse & followers
- Feedback & improvement

Description and validation of:
- Needs
- Experiences
- Best practices
- Failures

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Goals: to serve as an inspirational document looking at integrated planning and management of smart city projects:

- **What** is integrated planning and management of smart city projects
- **How** to develop a smart city strategy and who to involve
- **Which** barriers can you expect and how to deal with them
- **Which** coordination tasks can be expected and how to deal with them
- **Where** can you find information on financial instruments
- **How** to engage stakeholders and keep them engaged during different phases of implementation
- **How** can KPI’s and tools help to evaluate alternatives and track progress
- **Which** actions can help to accelerate the impact towards an urban transition
Based on methodology
European Energy Award
A smart and sustainable cities roadmap for integrated planning and management of smart city projects
Example of obstacle and solutions

Smart city projects are often managed by vertically structured departments (silos) in the local government. Other project stakeholders, including local businesses, solution providers, and universities, are often siloed as well. Since no single department has the full mandate (or ability) to implement a holistically designed project, this can lead to long negotiations, and delays or postponement of implementation of the project.

Why an obstacle and what are the consequences?
"Getting different departments working together is a common problem (the silos issue – part of the game". This "policy gap occurs when ministries, public agencies, authorities, departments work in silos without co-ordination mechanisms, and roles and responsibilities are not clearly allocated across levels of government". The lack of horizontal coordination, cooperation, collaboration, or acceptance between vertical departments is a well-known issue in organizations and projects, and a common problem in the implementation of smart city projects. During implementation of integrated strategies and plans in siloed organisations, no department generally has full mandate for achieving the targets. This can lead to long negotiations, delays or even postponement of the implementation of the project. Siloed organizational structures can involve many issues that complicate the implementation process: information islands, the lack of an overall strategic vision, task fragmentation, and overlapping or blurred responsibilities. All of these can be a direct result of a lack of coordination and communication between departments.
Solutions:
The issue of silos can be resolved by the clear definition of a person or entity (a system integrator) in charge of horizontal coordination with sufficient responsibilities and mandate. Successful coordination would require the establishment of truly multi- or inter-disciplinary teams. This approach will need to be adapted for each instance, as there is no standardized organizational structure for municipalities or their agencies. Some approaches to overcoming silos initiated by cities include:

- installing cross-sector departments (New York City)
- creating "special staff units" (Ludwigsburg)
- installing informal interdepartmental working groups (Freiburg)
- outsourcing the duty to quasi-independent project management companies (Vienna) ¹

Another approach is to collect and aggregate the different city infrastructure data streams and control operations in a single structure - an operations centre. Co-located services and employees from different departments, working together, may act as a "nerve centre" to facilitate coordination and communication, breaking down some of the walls of administrative silos ².
Examples:

- "Bristol in the U.K." has "given senior executives a broad smart city mandate. Bristol is also breaking down silos between different departments in the municipality. To save money on real estate and improve coordination, the local authority is planning to co-locate nine teams in one space, which should help the city adopt new sensing technologies on a citywide scale. Bristol is also making sure it has high-level expertise in-house, primarily to ensure it doesn’t become heavily reliant on a single vendor or systems integrator. 'The local authority has been astute enough to hire people with quite sophisticated technology and procurement backgrounds,' said Paul Wilson, managing director of Bristol Is Open, the smart city unit for Bristol. 'We know our strategy and we will go to vendors to fulfil aspects of our strategy. We have the intelligence to know what our plan is and we are in charge. That is very important for a city or it will be blown around in the wind of vendor games.'"

- "In March 2014, Amsterdam created the role of chief technology officer (CTO). The role is responsible for breaking down silos across the city government, setting overall strategic direction, providing a consistent face to external stakeholders and helping to navigate a complex political landscape." 4.

- "Regarding silos and getting people to work together, physical proximity can be very helpful" "Get people working together by actually working together - in proximity to each other" "Communication is key" 3.

- "XXX at the moment is establishing an overall strategy for the city that is linked with budget and that is very new - before we were sectoral - we had a sectoral approach.... mobility was a certain budget, and built environment was another budget, and now we are trying to have an overall system of objectives and goals, that everybody can decide on" (Interviewee #5, 2017, p. 2).

- "...it’s an effort and an initial obstacle ... maybe in the beginning, for a city that is new to, or is working for the first time in this way. So I think that it is a process that is necessary to follow and also compulsory to work in a coordinated way between all the municipal departments and to have this governance structure or coordination quite clear" 7.

- "Project tools and joint work spaces - Shared project planning tools go some way to bring coherence to interaction between staff that rarely work together but there requires an enabling structure in the management of projects that facilitates this joined-up working" 8.
Example: citizen engagement
Going forward

We have selected 5 testbed cities

- Helps to create long term vision for integrated planning
- Gives examples of Integrated planning
- Describes common pitfalls
- Helps to prepare urban plan for follower cities

Finalisation of the SCGP
December 2017

Dissemination among cities and test it with 5-6 follower cities
Until Mid 2018

Final version and official presentation of the guidance package in Brussels during open days in October
Replication of success stories
Alignment on EU-wide set of KPIs (including UN SDG)
Until End 2018

1) The SCGP will be regularly updated and in a electronic version.
WHAT WE CAN OFFER TO YOU NOW:

1. Supporting you in developing a dedicated Smart city roadmap for integrated planning and management of smart city projects.

2. Giving you tips on how to better include mobility and energy solutions from lighthouse cities in follower cities integrated urban planning.

3. Advising how to create task forces with people from different departments to avoid “silo effect”.

In the replication phase:

1. Benefit from our joint collaboration with Smart cities information system, the EIP Smart cities marketplace, Eurocities network, and the Urban Agenda from DG REGIO to better set up/improve your replication and upscaling approach.

2. Facilitate B2B meetings with Investors and banks under the European institutional umbrella (i.e., during the next General Assembly in Sofia 28 June).

Visibility and Communication:

1. Promote articles/video in SCIS during the demo-visit and in EIP Smart cities website.

2. Invite you and your politicians as speakers at the political event in Brussels in October for the launch of SCGP.

3. Keep the attention of EU Institutions and Member States on barriers encountered and how to improve legislation to better fit with city needs and services’ improvement.
Ready for cooperation!!

Thank you for your attention!

E-mail: judith.borsboom@ntnu.no

1) The SCGP will be regularly updated and in a electronic version.
Thank you for your participation

For more information, contact us at: integratedplanning@eu-smartcities.eu