

International Energy Agency

Implementation of Energy Strategies in Communities (Annex 63) Volume 4: Stakeholder support materials

**Energy in Buildings and Communities Programme
March 2018**



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Preface

THE INTERNATIONAL ENERGY AGENCY

The International Energy Agency (IEA) was established in 1974 within the framework of the Organisation for Economic Co-operation and Development (OECD) to implement an international energy programme. A basic aim of the IEA is to foster international co-operation among the 29 IEA participating countries and to increase energy security through energy research, development and demonstration in the fields of technologies for energy efficiency and renewable energy sources.

THE IEA ENERGY IN BUILDINGS AND COMMUNITIES PROGRAMME

The IEA co-ordinates international energy research and development (R&D) activities through a comprehensive portfolio of Technology Collaboration Programmes. The mission of the IEA Energy in Buildings and Communities (IEA EBC) Programme is to develop and facilitate the integration of technologies and processes for energy efficiency and conservation into healthy, low emission, and sustainable buildings and communities, through innovation and research. (Until March 2013, the IEA EBC Programme was known as the IEA Energy Conservation in Buildings and Community Systems Programme, ECBCS.)

The R&D strategies of the IEA EBC Programme are derived from research drivers, national programmes within IEA countries, and the IEA Future Buildings Forum Think Tank Workshops. These R&D strategies aim to exploit technological opportunities to save energy in the buildings sector, and to remove technical obstacles to market penetration of new energy efficient technologies. The R&D strategies apply to residential, commercial, office buildings and community systems, and will impact the building industry in five areas of focus for R&D activities:

- Integrated planning and building design
- Building energy systems
- Building envelope
- Community scale methods
- Real building energy use

THE EXECUTIVE COMMITTEE

Overall control of the IEA EBC Programme is maintained by an Executive Committee, which not only monitors existing projects, but also identifies new strategic areas in which collaborative efforts may be beneficial. As the Programme is based on a contract with the IEA, the projects are legally established as Annexes to the IEA EBC Implementing Agreement. At the present time, the following projects have been initiated by the IEA EBC Executive Committee, with completed projects identified by (*)

and joint projects with the IEA Solar Heating and Cooling Technology Collaboration Programme by (☀):

- Annex 1: Load Energy Determination of Buildings (*)
- Annex 2: Ekistics and Advanced Community Energy Systems (*)
- Annex 3: Energy Conservation in Residential Buildings (*)
- Annex 4: Glasgow Commercial Building Monitoring (*)
- Annex 5: Air Infiltration and Ventilation Centre
- Annex 6: Energy Systems and Design of Communities (*)
- Annex 7: Local Government Energy Planning (*)
- Annex 8: Inhabitants Behaviour with Regard to Ventilation (*)
- Annex 9: Minimum Ventilation Rates (*)
- Annex 10: Building HVAC System Simulation (*)
- Annex 11: Energy Auditing (*)
- Annex 12: Windows and Fenestration (*)
- Annex 13: Energy Management in Hospitals (*)
- Annex 14: Condensation and Energy (*)
- Annex 15: Energy Efficiency in Schools (*)
- Annex 16: BEMS 1- User Interfaces and System Integration (*)
- Annex 17: BEMS 2- Evaluation and Emulation Techniques (*)
- Annex 18: Demand Controlled Ventilation Systems (*)
- Annex 19: Low Slope Roof Systems (*)
- Annex 20: Air Flow Patterns within Buildings (*)
- Annex 21: Thermal Modelling (*)
- Annex 22: Energy Efficient Communities (*)
- Annex 23: Multi Zone Air Flow Modelling (COMIS) (*)
- Annex 24: Heat, Air and Moisture Transfer in Envelopes (*)
- Annex 25: Real time HVAC Simulation (*)
- Annex 26: Energy Efficient Ventilation of Large Enclosures (*)
- Annex 27: Evaluation and Demonstration of Domestic Ventilation Systems (*)
- Annex 28: Low Energy Cooling Systems (*)
- Annex 29: ☀ Daylight in Buildings (*)
- Annex 30: Bringing Simulation to Application (*)
- Annex 31: Energy-Related Environmental Impact of Buildings (*)
- Annex 32: Integral Building Envelope Performance Assessment (*)
- Annex 33: Advanced Local Energy Planning (*)
- Annex 34: Computer-Aided Evaluation of HVAC System Performance (*)
- Annex 35: Design of Energy Efficient Hybrid Ventilation (HYBVENT) (*)
- Annex 36: Retrofitting of Educational Buildings (*)
- Annex 37: Low Exergy Systems for Heating and Cooling of Buildings (LowEx) (*)
- Annex 38: ☀ Solar Sustainable Housing (*)
- Annex 39: High Performance Insulation Systems (*)

- Annex 40: Building Commissioning to Improve Energy Performance (*)
- Annex 41: Whole Building Heat, Air and Moisture Response (MOIST-ENG) (*)
- Annex 42: The Simulation of Building-Integrated Fuel Cell and Other Cogeneration Systems (FC+COGEN-SIM) (*)
- Annex 43: ☀ Testing and Validation of Building Energy Simulation Tools (*)
- Annex 44: Integrating Environmentally Responsive Elements in Buildings (*)
- Annex 45: Energy Efficient Electric Lighting for Buildings (*)
- Annex 46: Holistic Assessment Tool-kit on Energy Efficient Retrofit Measures for Government Buildings (EnERGo) (*)
- Annex 47: Cost-Effective Commissioning for Existing and Low Energy Buildings (*)
- Annex 48: Heat Pumping and Reversible Air Conditioning (*)
- Annex 49: Low Exergy Systems for High Performance Buildings and Communities (*)
- Annex 50: Prefabricated Systems for Low Energy Renovation of Residential Buildings (*)
- Annex 51: Energy Efficient Communities (*)
- Annex 52: ☀ Towards Net Zero Energy Solar Buildings (*)
- Annex 53: Total Energy Use in Buildings: Analysis and Evaluation Methods (*)
- Annex 54: Integration of Micro-Generation and Related Energy Technologies in Buildings (*)
- Annex 55: Reliability of Energy Efficient Building Retrofitting - Probability Assessment of Performance and Cost (RAP-RETRO) (*)
- Annex 56: Cost Effective Energy and CO₂ Emissions Optimization in Building Renovation (*)
- Annex 57: Evaluation of Embodied Energy and CO₂ Equivalent Emissions for Building Construction (*)
- Annex 58: Reliable Building Energy Performance Characterisation Based on Full Scale Dynamic Measurements (*)
- Annex 59: High Temperature Cooling and Low Temperature Heating in Buildings (*)
- Annex 60: New Generation Computational Tools for Building and Community Energy Systems (*)
- Annex 61: Business and Technical Concepts for Deep Energy Retrofit of Public Buildings (*)
- Annex 62: Ventilative Cooling
- Annex 63: Implementation of Energy Strategies in Communities
- Annex 64: LowEx Communities - Optimised Performance of Energy Supply Systems with Exergy Principles
- Annex 65: Long-Term Performance of Super-Insulating Materials in Building Components and Systems
- Annex 66: Definition and Simulation of Occupant Behavior in Buildings
- Annex 67: Energy Flexible Buildings

- Annex 68: Indoor Air Quality Design and Control in Low Energy Residential Buildings
- Annex 69: Strategy and Practice of Adaptive Thermal Comfort in Low Energy Buildings
- Annex 70: Energy Epidemiology: Analysis of Real Building Energy Use at Scale
- Annex 71: Building Energy Performance Assessment Based on In-situ Measurements
- Annex 72: Assessing Life Cycle Related Environmental Impacts Caused by Buildings
- Annex 73: Towards Net Zero Energy Public Communities
- Annex 74: Competition and Living Lab Platform
- Annex 75: Cost-effective Building Renovation at District Level Combining Energy Efficiency and Renewables
- Annex 76: ☀ Deep Renovation of Historic Buildings Towards Lowest Possible Energy Demand and CO₂ Emissions
- Annex 77: ☀ Integrated Solutions for Daylight and Electric Lighting

Working Group - Energy Efficiency in Educational Buildings (*)

Working Group - Indicators of Energy Efficiency in Cold Climate Buildings (*)

Working Group - Annex 36 Extension: The Energy Concept Adviser (*)

Working Group - HVAC Energy Calculation Methodologies for Non-residential Buildings

Project Overview

BACKGROUND

Energy Efficient Communities (IEA-EBC Annex 51) suggested that successful urban energy planning is only possible, if energy planning is integrated in the entire urban planning process. However, research in both Annex 51 and Annex 63 has found that in many countries consideration of energy issues is missing in urban planning processes. This is of great concern, since, with the growing challenge of climate change, municipalities and energy utilities are charged with implementing both measures that adapt to the present conditions and measures that mitigate against future impacts. Both parties, municipalities and energy utilities, must coordinate their actions and both need a comprehensive set of tools and strategies to manage their resources so as to minimise the generation of greenhouse gases.

The linkage between urban form, energy use and climate change has been recognised for many years yet there still remain significant barriers separating the goals of urban planning and those of efficient energy delivery. In current practices energy related issues are still isolated from virtually all other municipal services; building codes for example often limit their scope to building safety and ignore the impact of energy consumption. By integrating strategies about optimizing supply, delivery and consumption of energy with (municipal or utility) planning protocols both municipalities and utilities can deliver to their constituents a powerful set of strategies with which to address climate change.

A natural connection should exist between urban development and energy development. Historically, the separation of each field's priorities and practices has created an energy efficiency challenge that requires a new and improved set of planning tools and strategies.

CONTENT

IEA-EBC-Annex 63 aims to identify strategies that can unify urban and energy planning communities and allow both parties to engage in the process of change to reach long term targets. The research addresses key barriers that expand the scope of planning and lead to a more comprehensive understanding of the new, urban, low-carbon environment. The outcome of this project is that governments, urban decision makers, utilities and urban planning departments can develop a clearer understanding as to how they integrate energy issues into urban planning processes and what actions they must undertake and when, in order to be successful.

PARTICIPATING COUNTRIES

Following countries (represented by 19 organisations) have been participating in Annex 63: Austria, Canada, Denmark, France, Germany, Ireland, Japan, the Netherlands, Norway, Switzerland and the United States of America.

INVOLVED CITIES

Following cities were involved in Annex 63: Salzburg, Vienna (Austria), Burlington, Guelph, London (Ontario), Toronto (Canada), Egedal, Middelfart, Roskilde, Skive (Denmark), Lille, Strasbourg (France), Aachen, Ludwigsburg, Karlsruhe (Germany), Kitakyushu, Yokohama (Japan), Maastricht (the Netherlands), Oslo, Bergen (Norway), Basel (Switzerland), Minneapolis (USA). Also Graz (Austria), Ottawa, Pickering (Canada), Ballerup, Lyngby (Denmark), Bottrop (Germany), Amsterdam, Parkstad (the Netherlands) and Zürich (Switzerland) supported the project team with information and case studies.

METHODOLOGY

To better understand the composition of suitable energy strategies, the research program adopted the following approach:

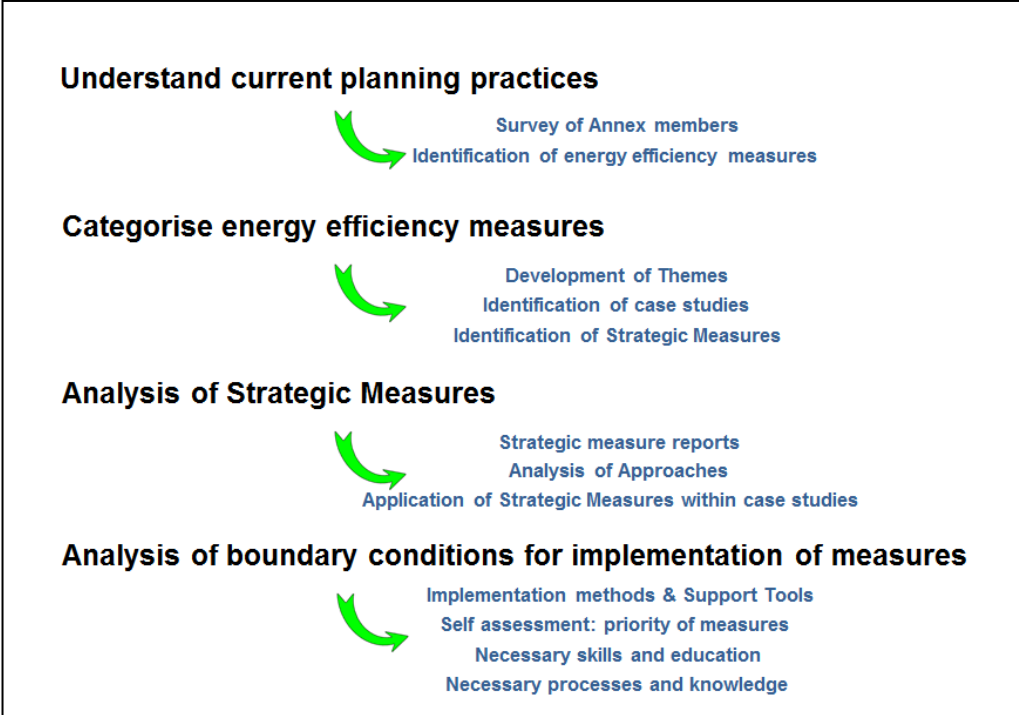


Figure A: Research Methodology (NRCan, 2017)

OUTPUTS

The results of Annex 63 (Implementation of Energy Strategies in Communities) are documented in six Volumes (sequenced according to the development progress). For orientation, the name and content of each Volume is described in the following overview:

Volume 0 – Documentation of workshops and involvement of cities: This report describes the information exchange and dissemination activities undertaken within this research. The information exchange activities were essential to get and understand all relevant information for answering the research question and to contribute to practical appropriability. In total 143 information exchange activities with 2,394 people were carried out.

Volume 1 – Inventory of measures: This report describes the existing national political framework conditions, energy and land-use planning processes, strategies for energy planning and existing national measures in the field of urban and energy planning. In this research, the term measure refers to any action, program, policy or other activity that can demonstrate or influence a change in process. Amongst other background information, 22 planning processes and 89 measures from 11 countries are described in detail in this report.

Volume 2 – Development of strategic measures: This report describes the further development of the analysed measures from Volume 1 into strategic measures. As with the term measure, a strategic measure refers to an essential measure in concept that can be used to develop individual implementation strategies on a local level for part or the whole life cycle of a project (from the first vision to monitoring of the implemented solution). The developed strategic measures deal with the following topics:

- Setting Vision and Targets
- Developing Renewable Energy Strategies
- Making Full use of Legal Frameworks
- Designing an Urban Competition Processes
- Making use of Tools Supporting the Decision Making Process
- Implementing Monitoring of Energy Consumption and GHG Emission practices
- Enhancing Stakeholder Engagement & Involvement
- Including Socio Economic Criteria
- Implementing Effective and Efficient Organisational Processes

The report includes both a summary of each strategic measure supported by nine appendices, each a detailed description of each strategic measure.

Volume 3 – Application of strategic measures: This report describes, for different scales (city, district and project level) and for 29 conceptualised case studies, how implementation champions can apply the strategic measures from Volume 2. Implementation champions are hereby understood as stakeholders in the city who take the initiative to lead and facilitate implementation processes.

Volume 4 – Stakeholder support materials: This report describes, in more detail, within the framework of Annex 63 elaborated stakeholder support materials and their application. The materials deal with the following topics:

- Municipality Self-Assessment tool
- Capacity building and skills
- Workshop format and procedures
- Informational slides for presentations
- Education materials

Volume 5 – Recommendations: This report contains central recommendations for different target groups (e.g. policy makers, researchers, planners), for implementation and for further investigation. Justifications and examples in the field of urban and energy planning are central elements of this report.

HOW TO READ

Depending on the interest of the reader whether the focus might be on the application of results or on the methodology of producing the results, figure B shows the sequence of how best to use the Volumes.

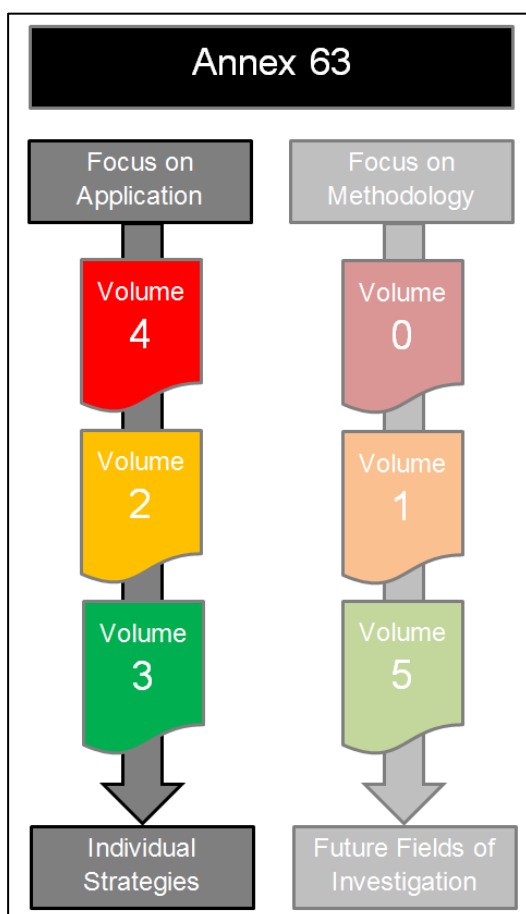


Figure B: How readers should apply the produced documents (SIR, 2017)

If the focus of the reader lies on the application of the elaborated results, the Volume 4 should be read first. The appendix of Volume 4 contains a municipality self-assessment tool that allows the reader to identify the strengths and weaknesses within the current municipal structure. Volume 4 also contains additional working materials (e.g. necessary capacities and skills, suitable workshop formats, informational slides for presentations and education materials) that support the implementation of strategic measures. Recommendations for the successful implementation of specific strategic measures can be found in appendix of Volume 2, leading to the application of different strategic measures as outlined in Volume 3. In this way, the reader gains from the three reports all relevant information for the development of individual implementation strategies.

If the reader is interested on methodological aspects of Annex 63, Volume 0 should be read first. Volume 0 contains the central information regarding the information exchange activities and input from the variety of annex stakeholders (cities, local stakeholder groups, project team, national and international networks, IEA Technology Collaboration Programmes). Principal output of this consultation process is also described in detail in Volume 1 (local framework conditions in 11 countries and 22

cities). Finally, all relevant recommendations for different target groups are summarised in Volume 5. Again, the reader gets in the three reports all the relevant information for further fields of investigation.

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1. Introduction

This research, conducted under Annex 63, identified and described a key number of areas of practice associated with the implementation of energy efficiency strategies. Applying the proposed strategic measures enable a municipality or community to accelerate the implementation and effect of their energy strategies (see Volume 2). As illustrated by the case study analysis in Volume 3, there is no single sequence of application of these strategic measures that ensures success but rather their use is dependent upon both the status of their implementation process and their specific situation and boundary conditions. In order to find out which strategic measures might have the highest priority for use within a specific situation, the municipality should undertake a critical self-assessment. The detailed assessment process is described in Chapter 2, aid the proponent in identifying and prioritising the strategic measures that best augment their specific circumstances.

Once identified, the next step is to implement the selected strategic measures. Undoubtedly the description of the strategic measures as outlined in Volume 2 is important, but also the description and the case study analysis within Volume 3 illustrates the impact of introducing measures at different stages of a project or programme. In many circumstances maximum information comes from visit the case study site with involved from the municipality. The project team knows that several examples exist whereby the mayor a municipality joined such a foreign trip and became very enthusiastic about applying the observed best-practices of strategic measures in his own city. These trips are invariably effective since there is more time available than during ordinary daily practice, more room for discussion and for asking specific questions.

From the case studies analysis in Volume 3 it is possible to see why the context and sequence of measures are of importance. Besides, the project team analysed that their are many boundary conditions and circumstances which are important during the successful implementation of the strategic measures.

As noted previously, one of the most critical boundary conditions is the capacity of the municipality: the people and skill sets that are available within a municipality for the implementation process. Especially, integration of urban planning and energy planning requires specific skills that address the two completely different disciplines. Also from the case studies and the theory of transition management (Loorbach et al., 2016) it has been recognised that a strong coordinator or champion of implementation is necessary. This resource acts simultaneously on three different levels of operation, namely: the strategic level towards the long term goals; the tactical level in which program choices are made and the operational level in which the projects and its activities are running. The challenge becomes one of coordinating the three levels in such a way that they are consistent and connected to each other while contributing towards each other in an optimal way.

Integration and champion skills are often new and not always automatically present within municipal organisations. The challenge is to identify, to hire or to train resources to develop these skills within the organisation.

In the implementation process also the interaction with the stakeholders in the field of implementation is needed to get a broad commitment and involvement in the initiative. Accessing as many stakeholders as possible often implies thematic-workshops to be organised. The selection, preparation and organisation of workshops with high quality output is often underestimated. Chapter 4 describes which workshops are suited for which output and how they should be organised in a professional way.

To personalise these workshops/modules one could make use of the slide-pool in chapter 5. This slide pool can also be used by consultants that support decision makers to initiate a transition management process to implement energy strategies in communities.

In order to help stakeholders to develop these skills the research team examined the range of education materials, currently available within the countries of the members of Annex 63. In Chapter 6 of this report, an inventory, an analysis and some recommendations are provided reflecting these education materials. Most of the time the education materials are descriptions of individual modules addressing specific topics.

Throughout the implementation process itself, high quality programme management and project management is necessary. The research team considers the description of these skills to be beyond the scope of Annex 63 and recognised the many courses and education material that is currently available in every country.

2. Municipality Self-Assessment tool

Aim of the provided self-assessment is to facilitate the application of the „strategic measures“ provided in report Volume 2. Target group for the self-assessment is the municipality considering the urban and energy planning process as a whole as well as the sum of implemented projects. The self-assessment can probably also be used as a checklist for the implementation of planning projects, but it has to be considered that it is not the aim to apply all strategic measures within one project, but to make sure, that the available possibilities of strategic measures are known and applicable where appropriate - on project scale and/or on city scale.

For a successful application of the outcomes of Annex 63 it is crucial for the user to first of all carry out a quick analysis of already applied strategies and existing gaps within the municipality. This helps to navigate through the strategic measures and quickly go into detail for the most urgent topics.

2.1. Structure of the self-assessment

The self-assessment tool is attached in appendix A-1 and can be downloaded as Microsoft Office file (*.xls) under this link: <https://www.annex63.org/results/volume-4/>

The self-assessment structure follows the strategic measures and their order of chronological ideal application in the planning process. Each section consists of 6 questions, following the logic of:

1. Awareness of benefits/content of the strategic measures
2. Available skills/knowledge/resources for the implementation of the strategic measures
3. Regular application of the strategic measures
4. Quality of the application of the strategic measure
5. Efficiency of the application of the strategic measures in the municipality (any impact)
6. Barriers and success factors of the application in the municipality

The first 5 questions are answered with a colour code: red (not applied, not known etc.), yellow (sometimes, some knowledge available etc.) or green (very often, good skills etc.). The 6th question is an open question with the opportunity to mention aspects and comments. All questions are detailed with hints for a “green” assessment, which should make it easier to decide on the marking.

2.2. Organisation of the self-assessment

The self-assessment can either be carried out as an interview or as a workshop with several participants (see also chapter 4). It is recommended to use the workshop approach as by this a variety of answers will be available which verifies the result.

It is recommended to not prepare the self-assessment with the participants of the workshop. On the one hand it reduces the efforts for the workshop participation; on the other hand the quality of the spontaneous feedback to the questions is an important aspect. Collect the knowledge that is applied proactively and not what has been found after intensive research in the archive!

2.3. Evaluation of the self-assessment

The collection of the answers for the self-assessment will result in an overview of the strengths and weaknesses regarding the application of strategic measures (see also Volume 3). In addition, the logic of the 5 (6) questions allows to quickly evaluate on which level improvement is necessary (organisational, knowledge, resources etc.).

Name of the municipality	xxx								
Date of the assessment	xxx								
Participants	xxx								
STATUS-QUO	Set Vision and Targets	Develop Renewable Energy Strategies	Make Full use of Legal Frameworks	Design of Urban Competition Processes	Make Use of Tools Supporting the Decision Making Process	Implement Monitoring of Energy Consumption and GHG Emissions	Stakeholder Engagement & Involvement	Include Socio-Economic Criteria	Implement Effective and efficient Organizational Processes
Awareness	Green	Green	Yellow	Red	Yellow	Green	Green	Green	Green
Available skills/knowledge/resources	Green	Green	Red	Red	Red	Green	Yellow	Green	Yellow
Regular application	Yellow	Green	Red	Red	Red	Yellow	Green	Green	Green
Quality of application	Red	Green	Yellow	Red	Red	Yellow	Red	Green	Green
Efficiency of application	Red	Yellow	Yellow	Red	Red	Yellow	Red	Green	Yellow

Figure 1: Example for the visualisation of the results (SIR, 2017)

After this evaluation, the link to Volume 2 report and its recommendations for strategic measures should be made.

The self-assessment does not replace existing comprehensive quality management and assessment tools for municipal energy and climate policy. It furthermore should motivate to implement such tools.

3. Capacity building and skills

By using the self-assessment tool of Chapter 2, one could determine if and what central roles and skills are missing within the decision making process e.g. the coordination function by a transition manager or so called “(Implementation) Champion” (Volume 3) is often missing. In Volume 3 the Implementation Champion is described as follows:

“Implementation champions can almost be anybody, as illustrated by the case studies. The most important characteristic for these champions is a drive – not only for pursuing energy strategies – but also for addressing bottlenecks in the implementation process. The cases also illustrate that implementation champions are not lone wolves, but rather act as a pack of wolves, supporting each other. In that sense, initial implementation champions ultimately represent a recruiter of new implementation champions, thereby expanding the network of stakeholders working for implementation of energy strategies. Through this constellation of implementation champions, a supportive network is created that represent different dimensions of the project, including those of urban and energy. “

This chapter of the stakeholder support materials gives recommendations on how to optimize your organisation with respect to capacity building and skill development. It also identifies the link to champions for the individual implementation (when to use what, with a strong link to Volume 3).

The capacity of people available within a municipality for the implementation process in possession of the appropriate skills is a prime boundary condition: especially, when urban planning and energy planning must be integrated. Specific skills are necessary to integrate the two completely different disciplines. Also from the theory of transition management (Loorbach et al., 2016) the research team concluded that a strong coordinator is needed to act simultaneously on three different levels of operation, namely: the strategic level towards the long term goals; the tactical level in which programmatic choices are made and the operational level in which the projects and activities are running. The challenge is to coordinate the three levels in such a way that they are consistent and connected to each other and contributing towards each other in an optimal way.

Multi level model

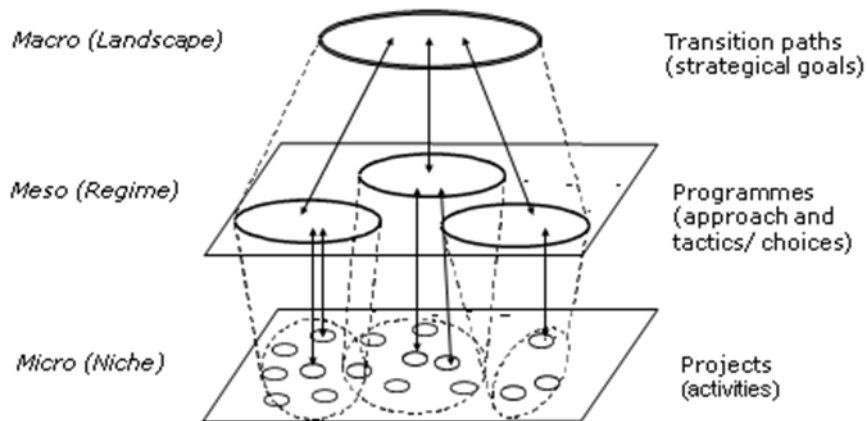


Figure 2: Multi level model (Loorbach et al, 2016)

Besides this skill, the analysis of the Case Studies in Volume 3 identified several other skills which are important for the implementation process:

- Technical competencies related to the ability to navigate in the technical jargon related to energy systems, including the ability to identify relevant technical specialists and involve them in the development.
- Socio-economic competencies related to understanding construction and planning practices with special emphasis on risk mitigation to overcome bottlenecks. Social acceptance and economic barriers represent crucial aspects to handle due to the innovative character of the implementation process.
- Political competencies in terms of being able to ensure political support. Without such support, there is a risk that the implementation process will be negatively impacted by political resistance.
- Managerial competencies in terms of providing the proper prioritization of resources and ensuring institutionalization of efforts. It is crucial that the right persons in the involved organizations are involved at the right time and in the right way. The implementation process has to be integrated into parallel processes, like budgeting, planning, organization, etc.
- Planning competencies in terms of having insight into the planning system and knowing how different planning instruments or planning moments may be used as a lever to the implementation process.
- Local community engagement competencies in terms of being able to work outside of the office and motivate external stakeholders to engage in the process. This might also involve internal staff in the city from other departments.

Having the ability to work hands-on and not only develop strategies on paper. This could include skills in dialogue, workshops and the like.

- Facilitation competencies in terms of being able to navigate in this complex process and to keep an overview of both the long-term trajectory and the short-term solutions needed to ensure commitment to the process. This could include skills in project management, but also dialogue and workshops.
- Skills for organising workshops (moderator)
- Skills for transition management (transition manager/ "Champion")
- Skills for leading coordination teams (coordinator, manager)
- Skills for running projects ("technical" skills)

Of course, these skills are not always automatically present within an organisation. The challenge is to identify, hire or develop these skills within the organisation. In order to help stakeholders in developing these skills the project team identified specific tailor made education materials as described in Chapter 6. In Chapter 4 the project team described formats for workshops and how the different workshops could be organised in a professional way.

From several workshops (see also Volume 0) and specifically the one held on April 20th 2017 in Kitakyushu the project team concluded the following needs and possibilities with respect to skills and capacity building:

- Awareness raising
- Self-training
- Positioning within the organisation
- Organising meetings and visits for information exchange
- Mandate and acceptance
- Organisational (re-)structure and framework for integration
- External parties
- Consistency in decision making
- Organising and facilitating common public private responsibility

In a first step one needs **awareness raising**. This could result from the self-assessment exercise in which one can find out which skills are available and which skills are missing.

From the workshops is concluded that the minimal requirement is that one needs training (see also chapter 6) or in case the courses are not available some form of **self-training** on the job.

Also important is the **position and positioning** of the involved people within the municipality. A change of position or role will not be always accepted by the surrounding.

It is inevitable that there are not yet courses available for every skill and role. Alternative approaches are possible: in many cases people for example people get inspired by **visiting other municipalities or meeting colleagues** from other municipalities in meetings. Some leaders who turned out to be inspired by other municipalities often show stronger leadership at home and take more interest in steering on the long term goals.

In many cases the Municipality or Mayor dedicates one person to be responsible for change management activities, with the **mandate** to manage the process. It is important that this person is accepted by the other departments and sections, because it is new position within the municipality.

In order to establish this position, the Municipality or Mayor has to provide an organisational **framework for an integrated process**. From this the project team conclude that is not only a matter of skills but also from **organisational structure**. This highlights not only the skills for the position but also the structure and the authority to influence change.

In situations where the change and the challenge seems too rigorous at the outset for a municipality to comfortably accept, an external party could be employed to play a “mirror” or “outboard motor” function for the process within the municipality. This **external party** could be a consultancy or an Agency. The requirement is to have the overview and knowledge derived from other Case Studies, projects and analyses. The preferably independent external party is mandated by the city and thus could guide the City in their actions: “now you are missing this information”, “now, you should claim budgets from another department” or “now you should make an agreement with this stakeholder”. Even then, the implementation process may not be easy because it is not often clear who should be responsible for which action within the municipality. This is especially true for integrated actions. After a while the municipality will re-organise and re-establish itself by using the “outboard motor” of an external party.

Such an independent external party could also provide **consistency in the decision making** process of the municipality. Often other departments, which are not directly related to sustainability and renewable energy, take decisions which are in conflict with the transition process and the long term goals. Also within the relevant departments one is often glad with any project which contains sustainable aspects. The danger is that those projects could be counter-productive and have a sub-optimal or negative impact to the transition process. An example of that counter-productive impact might be the energy-efficient renovation of houses in which they become just a little bit more efficient. The experience is that there will be not many more opportunities in the near future to improve the houses towards zero-energy. Although sometimes these kinds of projects are suited to raise awareness and public support but in that case the decisions should be deliberately taken towards this goal.

Another example of inconstancy is decisions on projects which are in conflict of the overall long term goals. For example it happened in one case that a city had decided

on an overall goal to reach 100% Climate Neutral in 2030. But it turned out that the new built houses in that district were not even oriented towards the sun which made it in this case difficult to achieve the overall goal. The municipal board claimed it is a matter of democracy that they could vote for every single project. One could doubt this, when one would consider the hierarchy of decisions: lower level decisions should obey the higher level, long term decisions.

In the Case Study of the air and water polluted industrial region of Kitakyushu (Shiroyama and Kajiki, 2016) the project team learned that once a **common responsibility arises between the municipality and the captains of industry** the transition to a green town can proceed very quickly. Since the captains of industry were born and raised in the same region and their children were harmed by the polluted region, they were very motivated to change the situation. The municipality adopted the role of facilitator by: organising meetings, organising knowledge, organising promotion, broadening scopes and organising national subsidies. One key ingredient in the role of public officials bridging the various levels and sectors of green city promotion was the training of officials as transition managers through on-the-job experiences. The City facilitated this training through “catered lectures”: the sharing of personnel with central government ministries and the interaction with private-sector initiatives.

4. Workshop procedures and formats

4.1. Workshop topics and procedures

Workshops are an effective way in order to bring people, competences, expertise and experience together. It is important therefore that adequate preparation is dedicated to this topic. As a component of Annex 63, workshops in different countries and of different formats were conducted. The following supporting material on the effectiveness and format of workshops aims to raise awareness as to the most important issues when conducting a workshop and offer guidelines, ideas and examples for coming workshops.

Referring to the previous deliverables described in the first three Volumes, several strategic measures have been formulated (detailed descriptions can be read in Volume 2), which could as well serve as a topic for workshops as well as performing the self-assessment:

- Set Vision and Targets
- Develop Renewable Energy Strategies
- Stakeholder Engagement & Involvement
- Include Socio Economic Criteria
- Implement Effective and Efficient Organisational Processes

The experience that was gained in workshops conducted before and during the Annex 63 research showed that:

- conducting a workshop in a professional way is underestimated;
- there are skills necessary to conduct a workshop in a professional way;
- the advantages of a professional way of organizing workshops are for example more commitment, more acceptances of decisions, results, procedures, a smooth implementation of measures, time savings and assurance of a follow-up.

The aim of this stakeholder support material is therefore to offer the municipalities that are developing strategic measures hints leading to efficiently conducted workshop and different types of workshops formats that are proven to be effective.

The effectiveness of a workshop depends strongly on the function of the moderator/facilitator and the preparation of the workshop. Therefore, it turns out suitable to finish a workshop by seeking feedback of the participants in order to know whether the workshop went right or wrong from the perspective of the participants and in order to be able to evaluate whether the aim defined at the beginning has been achieved. In the appendix A-2, these three points are worked out in more detail. The appendix contains also additional information to a facilitator's kit.

4.2. Workshop formats

The skilled moderator is able to choose according to the topic and the participants the right workshop format for the city workshop. That might be a:

- Conference of the future
- Unconference / Barcamp
- Workshop in status quo
- Round Table
- Energy Design Game

More information about about the workshop formats are listed in appendix A-2.

5. Informational slides for presentations

One central outcome from this research is that *“it is of great importance to create a common understanding and to explore interest relative to the topic.”* Therefore, within the framework of Annex 63, informational slides related to the topic “Implementation of Energy Strategies in Communities” were elaborated to reach these two goals.

5.1. Content

The informational slides contain all – within the framework of Annex 63 – elaborated results in a compact format. The slide pool is structured into the following six stages:

- Initial situation: This section gives answers to the question: Why must we implement energy strategies in communities? The main content is derived from the project description.
- The consultation process: This section answers the question: How were the results from Annex 63 developed? The main content is derived from Volume 0.
- Initial situation in 11 participating countries. This section answers the question: How are energy strategies currently implemented? The main content comes from Volume 1.
- Optimization approaches. This section answers the question: How can we implement optimized energy strategies in communities? It aims to generate desire. The main content is derived from Volume 2.
- Application of strategic measures. This section answers the question: How we can apply the strategic measures? It aims to generate desire. The main content comes from Volume 3.
- Next steps. This section provides guidance as to immediate steps to implementation. It aims to stimulate all relevant stakeholders to act. The main content comes from Volume 4.

5.2. Target of this stakeholder support material

The informational slides can be used to create individual PowerPoint presentations by choosing interesting slides from the slide pool (see Figure 3).

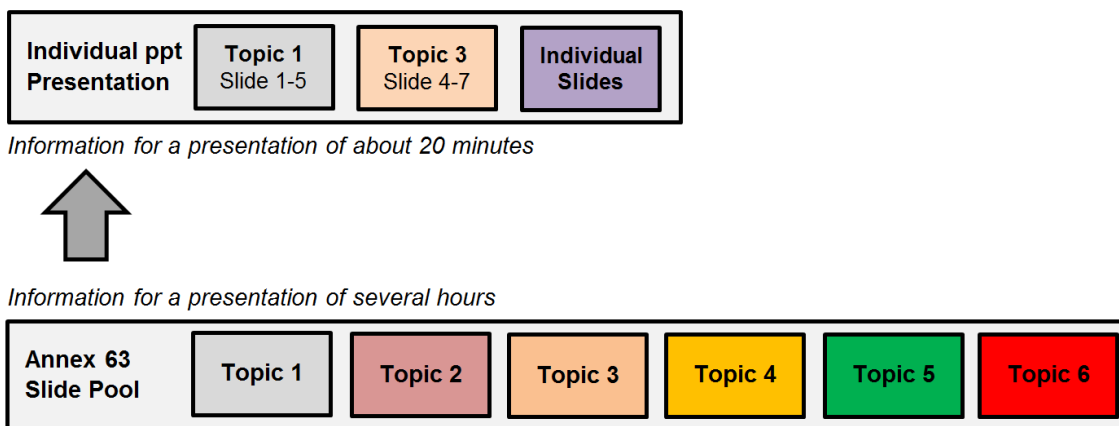


Figure 3: Main concept of this stakeholder support material (SIR, 2017)

The individual PowerPoint presentation can be used to get attention, generate interest, generate desire and to motivate relevant stakeholders to act.

This stakeholder support material was designed for use by consultants that support decision makers to initiate a transition management process to implement energy strategies in communities. Therefore the individual PowerPoint presentations should support the awareness building, show possible next steps and support the decision making process.

This slide pool can also be used from universities to prepare courses to the topic urban and energy planning (see also chapter 6). Also the slide pools under this links are recommended as basis for educational courses:

- Island Press: <https://islandpress.org/download-powerpoint> (viewed 11.10.2017)
- E-genius: <https://www.e-genius.at/mooc/kursuebersicht> (viewed 1.10.2017)

5.3. Application

To set up a successful presentation, it is necessary to answer as a first step the following questions:

1. Who is my target group?
2. What is the attitude of my target group?
3. What are the interests of my target group?
4. How relevant is the topic for my target group?
5. What should be the key message of the presentation?
6. What is the benefit for my target group?
7. What should the target group do after the presentation?

When these points are clear, it is necessary to select a suitable workshop format to reach the presentation targets. More information about this topic is listed in chapter 4.

Finally, relevant slides from the slide pool can be selected and added by individual information to create a powerful presentation.

To facilitate the navigation through the slide pool, hyperlinks are implemented into the slide pool.

For selected slides, additional information to the content is listed in the note area (view menu / note page).

5.4. Copyright

This slide pool was generated within the framework of IEA-Annex 63. All property rights, including copyright, are vested in SIR – Salzburg Institute for Regional Planning and Housing, Operating Agent for EBC Annex 63, on behalf of the Contracting Parties of the International Energy Agency Implementing Agreement for a Programme of Research and Development on Energy in Buildings and Communities.

If you use external pictures, don't forget to check the license type of the picture. In the best case the licence type is CC0; if all rights are reserved, additional request have to carry out, so that the picture can be used (see also Figure 4).

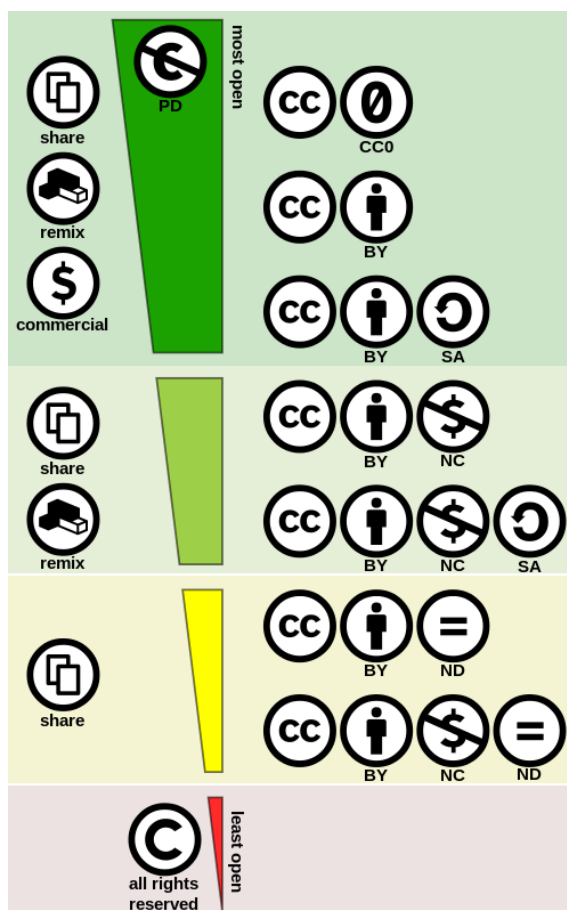


Figure 4: Creative commons license spectrum (Shaddim, 2016)

For more information regarding the licence of pictures visit: <https://creativecommons.org/> (viewed 11.10.2017)

Additional licence free pictures can be found on the following websites (viewed 11.10.2017):

www.unsplash.com: *All photos published on Unsplash can be used for free. You can use them for commercial and noncommercial purposes. You do not need to ask permission from or provide credit to the photographer or Unsplash, although it is appreciated when possible. More precisely, Unsplash grants you a nonexclusive copyright license to download, copy, modify, distribute, perform, and use photos from Unsplash for free, including for commercial purposes, without permission from or attributing the photographer or Unsplash. This license does not include the right to compile photos from Unsplash to replicate a similar or competing service.*

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The slide pool is attached in appendix A-3 and can be downloaded as Microsoft Office file (*.ppt) under this link: <https://www.annex63.org/results/volume-4/>

6. Education materials

The main outcome of Annex 63 is to advance the concept of integration of energy planning and urban planning. Integration can take many forms including physical and procedural. Some cities, such as Amsterdam, are addressing the physical integration by putting both planners in the same department with some degree of success. However, even in cases where the physical co-location of planners exists additional effort is required for both disciplines to become fully integrated in the implementation process. A primary challenge is that energy planning and urban planning are different disciplines in which practitioners are mostly educated in different branches of studies. The research suggested that there is a missing link in the educational process, the provision of which is essential for reaching the ambitions of communities.

A key recommendation coming out of this research is that more effort should be made to develop education material, courses and studies linking the planning disciplines. The skills to integrate and steer both disciplines are described in more detail in Chapter 3: Capacity Building & Skills.

Procedural integration can be seen as the sharing of information and the collaboration of staff. Some cities use common tools for both planning groups, in order to create a platform for communication. Examples of such tools are Resource Atlases, like the Energy Atlas of Amsterdam and district simulators like the Energy Concept adviser, developed in Annex 51. When not available, tools can be developed together thereby ensuring mutual compatibility. An example of this is a glossary of terminology and common assumptions.

To include the planning concepts into the educational syllabus, the following needs have been identified:

- Courses with “energy engineering for urban planner” and “urban planning for engineers”.
- Assignments in which the practices of both disciplines are shown to be relevant.

The research considered as the most prominent target groups, the current practitioners and the practitioners of the future (i.e. academics, graduates and apprentice craftsmen). The main difference between the two target groups is that the latter base their work on scientific papers and articles while current practitioners rely on more concrete examples such as the websites containing the detailed description and explanation of the various strategic measures.

In the short term this research provides the first example of education material in which the project’s outcomes are included (see appendix A-4). It is considered that most of the material can be used for both target groups but in order to develop future education material, which can be used in every country, an inventory was prepared of education material available within the participating countries. This inventory resulted in the description of several education modules, some full presentations and a selection of

slides (see also the Slide Pool in chapter 5). These can be used or adapted as required by the user.

Title	Language	Year	Contact person
Energy, Planning and the Built Environment	English	2016	Carissa Slotterback, Humphrey School of Public Affairs, University of Minnesota
Energy, Transportation & Land Use	English	2015	
Urban Energy & Infrastructure Systems	English	2015	
Climate Action Planning	English	2015	
Energy Planning	English	2015	
Community, energy and planning	English	2014	
Adapting the Physical City: Innovations in Energy, Transportation, and Water	English	2014	
Planning resilient and low-carbon cities	English	2013	
Energy for sustainability	English	2008	
Urban Energy Planning – Compact Seminar	English	2017	Andreas Koch, EIfER
Transition to energy neutral cities	English	2015	Jacques Kimman, Zuyd University
Energy and urban Planning: Possibilities, instruments, potentials	German	2017	Helmut Strasser, Salzburg Institute for Regional Planning and Housing
Smart neighborhood development in small and medium-sized towns: Ideas and impulses	German	2017	

7. References

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G. Stahn (2017): MA&T: <https://www.ma-t.de/gudrun-stahn.htm> (viewed 11.10.2017)

J. Surowiecki (2004): The wisdom of crowds. Why the many are smarter than the few and how collective wisdom shapes business, economies, societies and nations. Little, Brown, London, 2004

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