

# Case Study Analysis IMAGINE Low Energy Cities

- Munich -

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### 1) Case Study Munich

#### ***Introduction to the city of Munich***

The City of Munich is the capital of the federal state of Bavaria and the third-largest city in Germany. It covers 310.7 km<sup>2</sup>, hosting about 1.45 million inhabitants<sup>1</sup>. Munich is considered one of the most significant cultural and economic hubs in Germany<sup>2</sup>. Together with its surrounding, it constitutes a European metropolitan area, with knowledge accumulation, a variety of future-oriented branches, highly developed infrastructure and the scenic landscapes of the Alpine foothills being core characteristics<sup>3</sup>. In the German Green City Index, which assesses cities in terms of e.g. CO<sub>2</sub> emissions, energy consumption, or mobility, Munich scored above average in most categories<sup>4</sup>.

#### ***Energy policy***

The core of the energy policy is constituted by the climate protection strategy, which comprises several distinct elements (based on Franzl 12/4/2012). It aims primarily at the reduction of CO<sub>2</sub> emissions by means of energy conservation and promoting the expansion of renewable energies. The elements are referred to as four pillars, focusing different actors and instruments: (1) the urban development concept “Perspektive München”, more precisely its ecological guideline (Leitlinie Ökologie – LÖ), (2) the integrated action program (Integriertes

<sup>1</sup> <http://www.muenchen.de/rathaus/Stadtfinfos/Statistik.html> [08/29/13]

<sup>2</sup> <http://www.sueddeutsche.de/thema/M%C3%BCnchen> [09/04/13]

<sup>3</sup> <http://www.metropolregion-muenchen.eu/de/ueber-die-region/hintergrundinformationen/lage-und-umgriff.html> [09/04/13]

<sup>4</sup> <http://www.siemens.com/press/de/events/2011/corporate/2011-06-germany.php> [09/04/13]

Handlungsprogramm Klimaschutz in München – IHKM), (3) the “München für Klimaschutz” (MfK) alliance, and (4) public relations and cooperation.

The LÖ (cf. LHM 2011a) as a component of the urban development concept represents a strategic level<sup>5</sup>. It frames objectives and strategies of superior nature as well as specific to certain fields of action (e.g. energy supply, buildings, urban planning and mobility). The former comprise, for instance, reducing the CO<sub>2</sub> emission per capita by 50% by 2030 with respect to the baseline year 1990. Taken as a whole, qualitative objectives prevail, e.g. traffic abatement and reduction as guiding principles in the field of urban development and mobility. Beyond that, key projects to illustrate the strategies are specified. For actors in urban development (local authority and city-owned companies), these objectives constitute operational confines.

The purpose of the IHKM (cf. LHM 2012c) is to bundle activities of the local authority and to operationalize the objectives of the LÖ for the administration and is thus referred to as the operational level. In this regard, measures are developed in cross-departmental cooperation and combined in measures packages based on sustainability aspects and their cost-benefit-relation. The climate protection program that is reissued on a regular basis ascribes the packages to fields of action, allocates resources and frames concrete mandates. An example measure is the funding program for energy conservation (Förderprogramm Energieeinsparung – FES), subsidizing energetic measures in stock and new buildings.

The aim of the MfK alliance is to develop and implement climate protection measures and projects in cooperation with local stakeholders that are not subject to directives, such as corporations and businesses, educational institutions or NGOs. Subsequent to a project planning phase between 2007 and 2010 during which about 30 projects were developed, the implementation phase put these and some additionally developed projects into action. The projects comprised, for instance, informational, awareness-raising approaches as well as agreements on constructional standards. Since 2011, the alliance was continued as the MfK club with increased requirements for its members, who now have to compile an internal CO<sub>2</sub> balance and to engage in at least one CO<sub>2</sub> reduction project.

The fourth pillar distinguishes public relations and cooperation. The former consists of funding for environmental protection and Agenda 21 projects not yet embraced in the IHKM. The latter takes into account of the City’s engagement in national and international networks and initiatives such as Energy Cities or the Covenant of Mayors, which serves the purpose to provide new suggestions regarding further objectives and operational or strategic concepts.

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<sup>5</sup> Classification according to the climate protection strategy. It is not related to the TM concept.

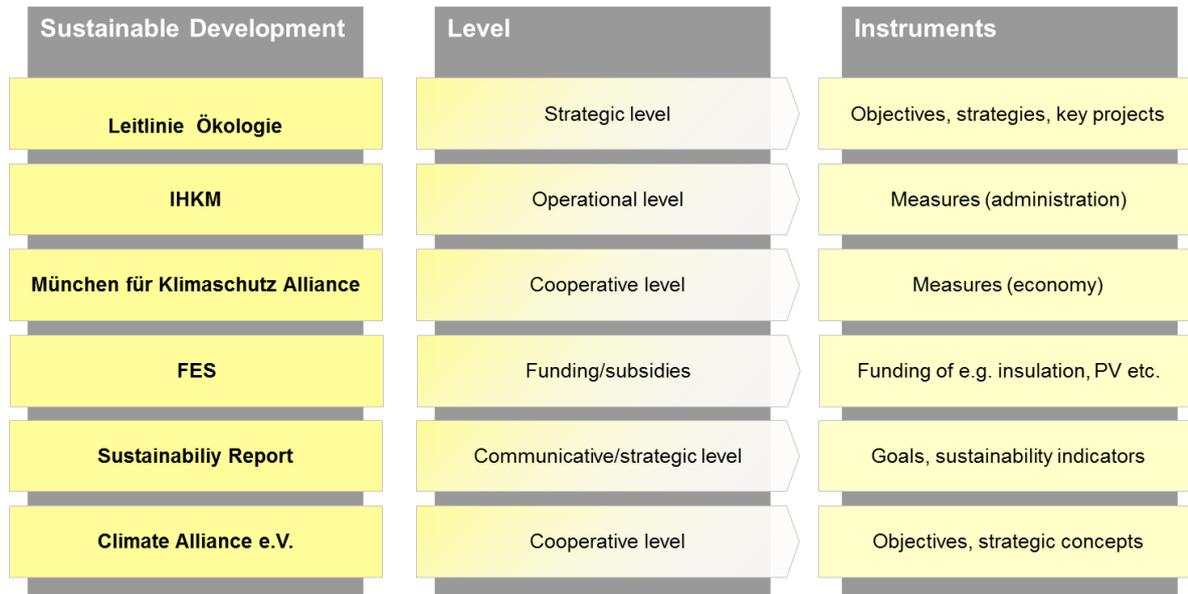


Fig. 1: Elements of Munich's climate protection strategy. (Franzl 12/4/2012, p. 17)

Fig. 1 above shows elements of the city's climate protection strategy as conceived by official quarters. Strikingly, it lacks the four pillar concept introduced earlier. Moreover, the elements are arranged abreast instead of following a coherent structure, and additional levels are introduced, e.g. funding by the FES, which on the other hand should be part of the IHKM. This suggests inconsistencies in the conceptualization of the climate protection strategy, which could be attributed to the fact that it is not a single, consolidated strategy but rather an umbrella term for different activities. These are partially deployed separately and not concerted as a whole (cf. INTERVIEW 1).

### **Transition Activities in Munich**

Following, the findings in terms of transition activities in the City of Munich from the Transition Management perspective are outlined. The data was derived from expert interviews with local stakeholders and additional, explicating policy documents by means of the qualitative content analysis method (cf. Mayring 1993, 2000). The findings are structured according to the guiding theoretical framework, i.e. activity clusters (strategic, tactical, operational and reflexive) and related individual activities or elements. Beginning with an overview table, each empirical element is described in detail, before it is assessed against the theoretical background. Subsequent to the outline of activities, the role of the local authority in Munich is described, and overall recommendations in view of improving the transition process are provided.

Cluster	Activity	Manifestation	Description	Assessment
Strategic	Problem structuring	Öko-Institut study 2004	Investigated municipal strategies and measures to reduce CO2 emissions by 50%	<ul style="list-style-type: none"> <li>• Converged administrative problem perception</li> <li>• Not generally shared, individual institutions develop own approaches in respect of focus themes and spheres of action <ul style="list-style-type: none"> <li>▶ Participative elements could align actors and stakeholders in view of a collectively approved problem</li> </ul> </li> </ul>
		Siemens study 2009	Examines pathways to achieve a nearly carbon-free future by 2058, related to fields of action	
		Leitlinie Ökologie	Processes the results of these studies and attempts to comprehensively structure the problem of climate change	
	Envisioning	2000W-society	Not adopted, but mentioned in LÖ	<ul style="list-style-type: none"> <li>• Emissions reduction is not an inspiring, mobilizing vision; only 2030 timeframe</li> <li>• 2000W-society was participatory introduced, no timeframe, but not evolutionary nor easily communicable</li> </ul>
		50% CO2 reduction by 2030	Abstract, overall, superior objective	
	Exchange of perspectives	Workshops LÖ	Several stakeholder workshops on different themes	<ul style="list-style-type: none"> <li>• Workshops approximate the concept of a transition arena, but not ongoing/regular <ul style="list-style-type: none"> <li>▶ IHKM project group could have stakeholders participating in order to incorporate additional perspectives/perceptions</li> </ul> </li> </ul>
Project group IHKM		Discusses measures and the further development of the strategy from a cross-sectional perspective		
Tactical	Thematic visions	SWM Ausbauoffensive	Expansion program for renewable energies and the district heating system	<ul style="list-style-type: none"> <li>• Fields of action objectives concretize superior goals at a thematic level; should be disseminated to non-administrative actors to guide concrete measures and projects</li> <li>• SWM objectives not embedded in a broader coalition; policies intransparent to external stakeholders <ul style="list-style-type: none"> <li>▶ An arena or coalition is expedient</li> </ul> </li> </ul>
		Fields of action LÖ	Superior objectives regarding the different thematic fields of action	
	Agenda	-	None of the empirical activities met the definition	<ul style="list-style-type: none"> <li>• Consistent translation of overall vision into action plans is lacking</li> <li>• Connection between measures and superior goals not very tangible <ul style="list-style-type: none"> <li>▶ Comprehensive transition agenda expedient</li> </ul> </li> </ul>
	Networks	MfK	Network of local actors and businesses as well as the local authority supporting the municipal CO2 reduction goals	<ul style="list-style-type: none"> <li>• MfK contributes to collective process to implement the overall vision and strategy, but could benefit from improved transparency and prominence to promote the ideas <ul style="list-style-type: none"> <li>▶ Klimaherbst themes could be aligned with municipal objectives and strategies</li> </ul> </li> </ul>
		Klimaherbst	Annual series of events building upon a network of local NGOs, educational institutions and businesses	
Operational	Experiments	e.g. Ackermannboden project	Solar local heat supply system for a housing complex	<ul style="list-style-type: none"> <li>• SWM does usually not engage in pilot/experimental solutions</li> <li>• Pilot projects funded by federal funds, as common funding programs can only be retrospectively adapted <ul style="list-style-type: none"> <li>▶ Close collaboration between developers and administration could accelerate adaptation and adjustment</li> </ul> </li> </ul>
	Implementation	IHKM measures	Implementation portfolio containing concrete measures for different fields of action and departments	<ul style="list-style-type: none"> <li>• Considerable variety of measures included due to different fields of action</li> <li>• Not geared towards participation, lack communication <ul style="list-style-type: none"> <li>▶ Intermediary transfer activities and awareness-raising expedient</li> </ul> </li> </ul>
Reflexive	Monitoring/Evaluation	Climate Protection Report	Gives account of municipal activities related to the IHKM	<ul style="list-style-type: none"> <li>• Monitoring efforts include individual projects and measures</li> <li>• Have to be considered sufficient due to vague conceptualization of TM monitoring</li> </ul>
		CO2 emissions inventory	Regularly updated balance of municipal CO2 emissions	
	Adaptation/Adjustment	IHKM issues	Biennial reissues accompanied by adjustment of measures	<ul style="list-style-type: none"> <li>• Individual measures are adjusted on a regular basis <ul style="list-style-type: none"> <li>▶ Reframing perspective and scrutinizing visions and long-term strategies expedient</li> </ul> </li> </ul>

## ***Strategic Activities***

### ***Problem structuring***

Description: In terms of problem structuring, two scientific studies exhibiting a cross-sectoral perspective are central. The first of them was conducted in 2004 by scholars of the Öko-Institut in Freiburg (Timpe et al. 2004) on behalf of the local authority. It investigated municipal strategies and measures to reduce CO<sub>2</sub> emissions by 50% with respect to the baseline year 1987. In that regard, emission scenarios were developed for several fields of action such as heat demand of private or commercial buildings, or passenger traffic. The findings were used to highlight adequate strategic pathways and measures and facilitate thematic priorities. The study concludes that with an ambitious municipal strategy, CO<sub>2</sub> emissions could be halved by 2030.

The so-called Siemens study was committed to the municipality, but commissioned by the Siemens AG and conducted by scholars of the Wuppertal Institute for Climate, Environment and Energy in 2009 (Siemens AG 2009). The study examines pathways to achieve a nearly carbon-free future by 2058, related to fields of action such as transportation or electricity supply. In this regard, it focuses urban infrastructure and the potential of respective technologies to reduce CO<sub>2</sub> emissions instead of concrete measures or municipal strategies.

The municipality processed the results of these studies and moreover attempted to comprehensively structure the problem of climate change in its update to the “guideline ecology” (LÖ) in 2011, which is part of the city’s urban development concept (LHM 2011a, pp. 7ff.). This comprised delineating the challenges in terms of mitigation and adaptation, parameters and objectives at higher political levels as well as a summary of municipal activities. Furthermore, specific operative requirements related to different fields of action as well as major obstacles and conflicts were identified.

Assessment: The two main studies focused different aspects of long-term development, i.e. municipal instruments and urban infrastructures to considerably reduce CO<sub>2</sub> emissions. Apparently, this type of problem structuring has influenced the political process, as results and recommendations were adopted in terms of policies and programs, e.g. the fields of action in the LÖ and the IHKM. Meanwhile, the problem perception on the administrative side seems to have converged, as the inter-departmental cooperation has significantly improved (INTERVIEW 1). On the other hand, it is questionable to what extent this problem perception is shared beyond the local authority, as participative elements were not involved (INTERVIEW 2). Moreover, one interviewee notes that individual institutions and associations often come up with own approaches to structure and tackle the problem in respect of their focus themes and sphere of action (INTERVIEW 3). This could obstruct further efforts to align actors, stakeholders and citizens in view of a collectively approved problem. Beyond that, TM suggests a complex systems analysis that takes account of physical stocks and flows within the city rather than just focusing on CO<sub>2</sub> emissions. Future problem structuring efforts could benefit from considering this along with participative approaches, incorporating additional aspects that have to be taken into account when developing integrated solutions.

### ***Envisioning***

Description: Due to its character as an abstract, overall, superior objective, the goal to reduce CO<sub>2</sub> emissions per capita by 2030 by 50% in respect of the baseline year 1990 can be considered an envisioning activity. The goal was adopted in 2008 by the City Council (LHM 2008) and features a 10% reduction every 5 years.

Furthermore, there is the 2000W-society vision, which is mentioned as a long-term objective in the LÖ (LHM 2011a, p. 25). The underlying idea is to limit the energy use of citizens to 2000W per capita, resulting in a decrease in the annual energy consumption (Bretschger et al. 2010, p. 3). The vision has not been adopted as a council resolution yet (INTERVIEW 1). Therefore, it is not binding for the local authority and does not influence its operational activities.

Assessment: The fixed 50% CO<sub>2</sub> reductions goal for the 2030 time horizon is certainly not the type of shared, inspiring, mobilizing vision TM envisages in an ideal situation, its overall, abstract character render this assignment reasonable. In this context, there is a sense that the different activities and approaches at various levels are rather collocated and fragmented instead of being embedded in coherent long-term considerations or an overarching vision (INTERVIEW 3). Accordingly, different initiatives and associations introduce their own particular sets of goals and objectives, with their compatibility and consistency often remaining uncertain. A post-2030 guiding vision that is shared among all stakeholders is required (cf. also INTERVIEW 1). In this regard, the second manifestation, that is the 2000-Watt-Society vision, could be useful in terms of long-term direction and convergence of action if it gets adopted by the local authority. The fact that it was introduced in the course of participatory workshops might contribute to general acceptance among stakeholders. The concept, however, seems rather cumbersome to communicate and is not widely used even on the administrative side (ibid.). Furthermore, it is also not genuinely evolutionary but constitutes a fixed end-point, although it could be adjusted based on new findings or experiences. Taken as whole, the IMAGINE motto rather represents the idea of an overall vision that is easy to relate to than the present manifestations.

### Exchange of perspectives

Description: The update process of the LÖ involved several stakeholder workshops on different themes in 2010 (INTERVIEW 1; LHM 2013b). Themes included for example urban planning and mobility or energy supply. The workshops provided citizens the opportunity to discuss strategies, focal points and to submit concrete proposals regarding goals and strategies of the updated LÖ. The proposals were thoroughly reviewed and refusals were justified (INTERVIEW 1).

The organizational structure of the IHKM comprises three levels: the steering committee, responsible for the overall process, the project group involving delegates of the various departments, and working groups on specific fields of actors in line with those identified by the Öko-Institute study (LHM 2010, pp. 1f.). Particularly the project group can be portrayed as a platform for cross-sectoral, inter-departmental exchange, as measures and the further development of the strategy are discussed from a cross-sectional perspective (INTERVIEW 1). This only involves administrative actors, not stakeholders or citizens.

Assessment: In terms of platforms for exchange on, and discussion of, overarching issues and themes, the public involvement during the update process of the LÖ approximates the concept of the transition arena. It comprised participation of stakeholders from different backgrounds and with different perspectives, a long-term orientation, and dealing with cross-sectoral issues. Furthermore, the 2000-Watt-vision emerged in this context. On the other hand, it was a onetime series of events related to the update process. It would probably go beyond the scope of municipality to establish this kind of extensive platform on a regular basis. In this regard, the project group of the IHKM could provide the foundations to involve certain stakeholders, for instance NGOs, in order to incorporate additional perspectives,

competences and understandings of the problem in view of the further development of measures and strategies, perhaps even visions. The transition arena's frontrunner approach could be useful in this context.

### ***Tactical Activities***

#### Thematic visions

Description: The LÖ frames superior objectives regarding the different thematic fields of action (LHM 2011a, pp. 33ff.). These can be considered thematic visions, including qualitative and quantitative objectives, for example securing the energy supply or increasing the renewable energy share by 20% by 2020.

The municipal utilities (SWM) as a city-owned company have own thematic visions regarding the expansion of renewable energies and the district heating system (SWM 2013a, 2012). In 2008, the expansion program "Ausbauoffensive Erneuerbare Energien" was adopted by the city council (INTERVIEW 4), rendering it binding for the SWM. It provides for the electricity supply of Munich by 100% renewable energies in terms of figures by 2025. As the city's area is limited, this involves investments and projects in other parts of Germany and Europe.

The so-called district heating vision aims to provide district heating from only renewable sources by 2040. It has not been adopted as a binding goal yet, but includes an investment and development program to expand the district heating grid to further city areas (SWM 2013b).

Assessment: At the tactical level, thematic visions are present in the form of guiding objectives in the LÖ as well as the SWM initiatives. The LÖ can be considered to correspond with the TM conceptualization to a large extent: the objectives were developed in a participatory way, they frame favorable futures regarding various fields of action, and they are subordinate to the overarching objectives (emissions reduction), making them more concrete at a thematic level. It is questionable, however, whether and to what extent they are shared among those non-administrative actors that have the capability and means to actually implement them in terms of measures and projects. In that regard, it would be expedient to bring these together in an arena or coalition. The criticism voiced by an interviewee concerning lacking political goals and overarching strategies supports this argument (INTERVIEW 3).

The SWM objectives clearly determine a direction in line with the overall vision. They are, however, not embedded in a broader coalition in the transition context, since exchange with competitors does not take place (INTERVIEW 4). In this context, an interviewee remarks that SWM policies appear to be guided by marketing considerations and are intransparent to external stakeholders (INTERVIEW 2). Decision-makers could enable public debate on this topic in order to prevent short-term and profit-oriented activities, for instance, by submitting these policies to public evaluation.

#### Agenda

Description: None of the empirical activities met the definition.

Assessment: Strikingly, no agenda in terms of an action or implementation plan could be identified. As one interviewee notes, breaking down the problem into sectoral strategies to guide everyday decisions and municipal institutions is still lacking since activities often get stuck in the visionary, abstract phase and are not put in concrete terms (INTERVIEW 3). Even in prominent domains that are particularly promoted and funded by the city, the connection to an overall vision is not readily tangible. Another interviewee concurs that the trans-

lation of objectives into concrete implementation plans and the sense of urgency cannot yet be satisfactorily observed (INTERVIEW 2). This also concerns the IHKM, which does not feature an implementation plan nor schedule (INTERVIEW 1). A transition agenda in terms of a combination of the overall problem definition and vision, the thematic visions and objectives as well as actions points, projects and instruments to realize the objectives is recommendable. This might also support actors who are willing to contribute to the transition, but depend on funding or fluctuant circumstances (cf. INTERVIEWS 2,4), as it provides a certain planning security.

### Networks

Description: The MfK club constitutes a considerable network of local actors and businesses as well as the local authority. The members committed themselves to support the municipal CO<sub>2</sub> reduction goals by developing and applying respective implementation strategies and to participate in at least one CO<sub>2</sub> reduction project (LHM 2011b). Furthermore, the club comprises regular meetings to discuss different topics and issues as well as implementation experiences.

The annual series of events “Münchener Klimaherbst” builds upon a network of local NGOs, educational institutions and businesses and is supported by the Department for Health and Environment (INTERVIEW 2). It involves multiple meetings and sessions on different themes regarding one major topic such as mobility or food. Thus, it aims at raising awareness and incites behavioral changes.

Assessment: The MfK club and Klimaherbst can both be interpreted as transition networks. MfK, however, is more in line with the overall vision and strategy, as its members committed themselves to support and promote these. Therefore, they share a similar overarching long-term direction and contribute to a collective process, as conceptualized by TM. On the other hand, while the underlying idea of MfK to involve economic actors regarding climate protection and mutually developing solutions is good, the implementation could be improved, as activities seem intransparent and ill-communicated to certain stakeholders (INTERVIEW 2). Likewise, it does not seem to be generally known among citizens (INTERVIEW 3). In order to mobilize and engage more stakeholders, public relations should be improved. The Klimaherbst network employs a more open approach to reach the public. However, it is rather committed to the general idea of sustainable development than concerned with municipal objectives and strategies. In that regard, convergence and alignment of themes and conveyed strategies seems advisable to establish and expand a supportive and concerted coalition of stakeholders.

## **Operational Activities**

### Experiments

Description: An example for an innovative, technological experiment is constituted by the urban development project “Solare Nahwärme Ackermannboden” (INTERVIEW 1, LHM 2007). It consists of a solar local heat supply system for a housing complex featuring a hot water tank, which provides 50% of the heating and hot water demand from solar energy. In a similar manner, an urban development pilot project in Freiham involved a geothermal local heating system and an urban energy concept (INTERVIEW 2; LHM 2013a).

Often in collaboration with, or as a contractor to, the local authority, the NGO Green City launches numerous projects and campaigns aiming at awareness-raising and behavioral changes (INTERVIEW 2).

Assessment: It would go beyond the scope of this thesis to comprehensively analyze innovative or experimental projects in the City of Munich. However, exemplary manifestations in this regard could be identified. Interestingly, both example urban development pilot projects were subsidized with federal funds. This seems consistent with the statement that SWM usually does not invest or engage in pilot, experimental solutions but focuses market-ready, established technologies<sup>6</sup> (INTERVIEW 4). Hence it is ceded to private businesses to engage in experimental projects on a regular basis (cf. INTERVIEW 3). One interviewee highlights that common funding programs can inherently only follow innovative developments and retrospectively be adapted (ibid.). Close collaboration between developers and the administration can accelerate this process, so that the reissued program may incorporate novel incentives for new technologies. There are no subsidies yet that specifically apply to experiments. Rather, technologies have to prove themselves worth funding in order to allow the city to adjust programs. Experiments that focus on learning about different options and possibilities in view of a long-term vision, on the other hand, are a crucial element of TM. One way to facilitate and encourage more experimentation could consist in the shared agendas mentioned above, as these influence the selection environment (Loorbach 2007, p. 123).

### Implementation

Description: The IHKM measures comprised can be portrayed as an implementation portfolio (cf. LHM 2012c). It contains concrete measures such as the FES funding program, ascribes them to different fields of action and departments, and allocates resources. Furthermore, realization timeframes for the single measures are defined and the expected CO<sub>2</sub> reductions are quantified if possible. It does not frame specific sectoral goals (INTERVIEW 1).

SWM particularly focuses on large-scale off-shore wind energy projects to achieve the goals of their renewable energy expansion program (INTERVIEW 4; SWM 2013a). Regarding PV, SWM invests in plants in countries with a higher solar potential, e.g. a solar-thermal power plant in Spain.

Assessment: Due to the multiple fields of action and related sub-topics of the IHKM, a considerable variety of measures is included. From the TM perspective, it is essential to involve a broad array of individuals and organizations in this context in order to disseminate the body of thought contained in the overall vision. Contrary to that, ongoing activities by the local authority are mostly not geared towards civil participation and lack public communication, as one interviewee notes (INTERVIEW 2). This calls for more intermediary transfer activities as well as stepped up efforts in terms of engagement and awareness.

### **Reflexive Activities**

#### Monitoring/Evaluation

Description: The city's climate protection report gives account of municipal activities related to the IHKM (cf. LHM 2012b). This comprises a description of the different fields of action, sub-topics and respective measures as well as a quantification of the CO<sub>2</sub> emission reduction achievements in terms of emissions per capita. The latter is based on the city's CO<sub>2</sub> monitoring balance and the measures' effects calculation. The CO<sub>2</sub> monitoring consists of a regularly updated balance of municipal CO<sub>2</sub> emissions (cf. LHM 2012a). Not yet gathered by this type

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<sup>6</sup> As matters stand, however, this comprises renewable energy technologies such as wind power or PV.

of monitoring and reporting are effects resulting from subsidized or funded third-party measures or campaigns (INTERVIEW 1).

Beyond that, the MfK club involves reporting by its members to the local authority on the progress of the respective projects in terms of feedback and particular summary reports (INTERVIEW 3). An overall assessment of CO<sub>2</sub> emissions has been scrapped in the MfK context (ibid.). Furthermore, the SWM report internally to the city council on a regular basis (INTERVIEW 4).

Assessment: Monitoring and evaluation takes place by means of the climate protection report in association with the CO<sub>2</sub> balance and further indicators such as, for instance, the number and power of PV installations. This provides an encompassing account of the city's activities and measures. Beyond this public reporting, internal reporting between contractors or MfK and the local authority occurs. Regarding the TM approach the conceptualization of transition monitoring remains rather vague. It must be assumed that the existing monitoring structures are generally sufficient. One issue pointed out by an interviewee, however, consists in assessing short-term effects of measures and projects within the building sector, since the evaluation period may be too short compared to the project development period (INTERVIEW 3). Individual projects within the scope of MfK are thus monitored and figures are provided, but a comprehensive assessment of the overall GHG emissions reduction has been scrapped, which complicates public projecting of results. Finally, the setting of interim objectives in an agenda could facilitate the evaluation and communication of results.

### Adaptation/Adjustment

Description: The IHKM is reissued biennially, which is accompanied by an adjustment of measures, i.e. new measures are incorporated and unsuccessful measures are scrapped (INTERVIEW 1). This does not include the overall superior goal in terms of reducing the CO<sub>2</sub> emissions by 50% by 2030. Furthermore, visions or objectives beyond this time horizon are not yet available.

According to an interviewee, the strategy of the SWM is adjusted on a regular basis in view of experiences and changed external circumstances (INTERVIEW 4). Newly developed projects are adapted in that regard based on experiences from former projects in terms of negotiations, implementation, administration and maintenance of projects.

Assessment: Regarding the adjustment and adaptation of policies and programs, the IHKM updates in the form of reissues constitute an example. Thus, individual measures are adjusted on a regular basis. TM suggests focusing social learning in terms of reframing perspective based on experience rather than transferring knowledge. In this context, these reflexive activities should be expanded to involve the overall direction in terms of the vision as well as agendas or the process in general. In line with this is the statement that though the alignment of visions and long-term strategic goals as a backlash of MfK project implementation experiences could not be noticed yet, it has to be considered vital in the context of the energy transition (INTERVIEW 3). There is a constant need to reflect and adapt the political priorities. This process has to be stimulated in the future in order to allow the backlash to happen and to scrap obsolete approaches or policies.

### **Role of LA in Munich**

It has to be initially noted that the interviewee selection as well as the complementing document review might over-emphasize the role of the local authority in transition-related activities, since in the field of vision is narrowed down to some extent. Therefore, many ongoing activities by external stakeholders and outsiders are not grasped and blinded out.

*The local authority of the City of Munich has developed an integrated programme of climate mitigation measures which has established processes of direct communication and cooperation among members of different departments of the local administration. Thus, this instrument has successfully led to the cross-sectoral and cross-departmental integration of measures. As a result, problem perception and long- and mid-term goals are widely shared among members of the local administration and influence their activities. Thus, the local transition activities of the different municipal department are oriented towards the defined overall goal. However, long-term goals are not widely shared among actors beyond the local administration as the established exchange of perspectives and processes of communication and cooperation quite strongly focus on municipal actors.*

*Overall, Munich's approach to energy transition focuses on the reduction of CO<sub>2</sub> emissions through increasing energy generation by renewable sources and increasing energy conservation. The measures are integrated in the city's urban development strategy and directly connected with newly established forms of cooperation among different actors, mainly but not exclusively from different administrative departments. The focus on reducing CO<sub>2</sub> emissions becomes especially evident on the levels of problem structuring and monitoring and thus influences all activities of strategy, plan and project development and implementation.*

In view of the activities identified above, the LA either acts as a decisive driver or at least facilitator. Third-party projects and initiatives, e.g. by Green City, MfK or Klimaherbst, are funded and/or supported. Furthermore, the possibility for public involvement in long-term strategy development was temporarily provided by means of stakeholder workshops.

In this regard, the TM concept suggests a more restrained role of the LA, rather enabling self-organization as well as facilitating mobilization and involvement of stakeholders with respect to a shared long-term orientation. This could benefit from establishing a regular platform or arena for exchange, where diverse stakeholders are specifically involved in the development of long-term goals and visions. The MfK initiative could constitute a starting point in this regard, whereas it is currently only concerned with supporting the implementation of existing goals. A further focus on "frontrunners" might be expedient.

Beyond that, the LA could support and guide external stakeholders' own efforts, projects and measures by mutually developing a strategic roadmap, i.e. a transition agenda that formulates pathways in view of an overall vision and related thematic or sectoral objectives.

### **Recommendations for further transition process**

As the initial table and the subsequent remarks showed, most conceptualized elements supporting the management of transitions could be identified. Moreover, the municipal climate protection strategy exhibits a multi-level structure that resembles the TM conceptualization, providing useful starting points for further improvement from this perspective.

The single activities are generally attributable to the overall objective of reducing the emissions by 50%. In this regard, a guiding long-term orientation is present. It is, however, recommendable to develop a more inspiring, mobilizing and easier to relate to vision to complement it. The basis for this should be provided by a participative platform, including regular meetings to refine long-term goals, thematic strategies and measures. The stakeholder workshops accompanying the LO update process showed how this could be done. The IHKM project group could act as a possible means to establish this on a regular, cross-departmental basis.

Since an agenda could not be identified, it is expedient to develop one to facilitate and enhance the translation of long-term goals into more concrete terms and measures by means

of a road map. Involvement of stakeholders and public communication is crucial in this regard in order to align activities and projects in view of a shared aim.

Furthermore, the backlash of project experiences on the adjustment of measures and strategies is not very tangible. It seems reasonable to increase public communication and decrease update intervals in order to improve adaptation in view of new insights and developments.

Altogether, the LA should provide more room for regular stakeholder involvement when it comes to strategic development decisions, evaluation of experiences and the adjustment or development of measures. It is imperative to motivate and align activities of stakeholders with respect to a shared ambition.

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