

100% RE Building Blocks

A practical toolkit for
a sustainable transition to
100% Renewable Energy



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HOW TO USE THE BUILDING BLOCKS

SHAPE



Users of the building blocks are invited to adapt the tool to their local context and identity as it is meant to provide flexibility for distinctive features and potential of different jurisdictions.

MONITOR



The building blocks are both a guideline for action and a tool to evaluate the performance and achievements of a community's efforts.

CUSTOMIZE



There are several overlaps between different actions and so the most effective implementation of one building block might arise only when also considering the recommendations of other blocks in a non-linear way.

ENGAGE



The building blocks can support the identification of relevant stakeholders from different sectors as well as government levels and stimulate their engagement.

LEVERAGE



The building blocks can leverage collaboration between governments' representatives from the municipal to national level, by supporting the alignment of purposes and streamlining of efforts across jurisdictions and constituencies.

Activate local resource potential

PERFORM PRELIMINARY ASSESSMENTS

Local communities should carry out preliminary assessments to establish their community energy consumption baselines. These provide greater understanding of the current state of energy use and start to prepare the data needed for formulating a 100% RE scenario and its specific pathways.

IDENTIFY PROGRAMS FOR SUPPORT AND ASSISTANCE

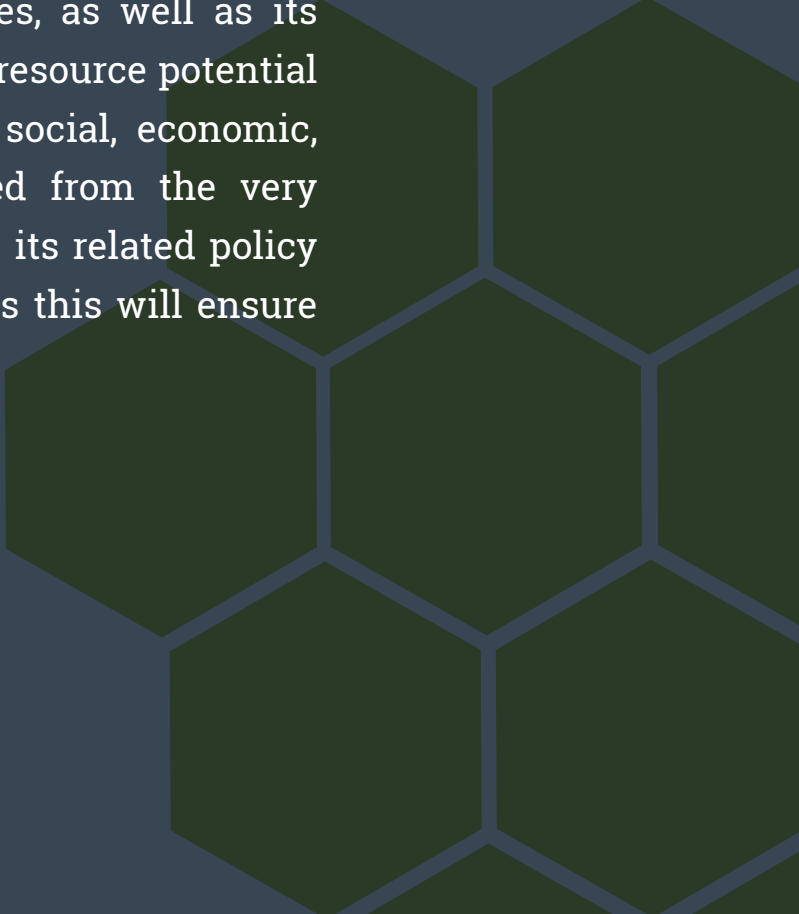
It is important that local governments start exploring existing options available at different scales (meaning for example at different levels of government) with the potential to support a successful 100% RE transition. These might range from capacity building programs to funding schemes that can be tailored to focus on renewable energy implementation and energy efficiency investments. This is an opportunity for the development of new and creative forms of funding and financing a 100% RE future.



MOBILIZE LOCAL RESOURCES

It is important that local actors are not left to work in isolation. From the outset, local governments must gather and engage interested parties, forming broad coalitions of concerned local actors, organize workshops and roundtables or engage with local utilities and regulators from the very start.

Any local actor or community that wishes to bring the 100% RE vision forward should understand the particularities of their place, the potential of their unique region and distinguishing features of their unique community. This includes, but is not limited to, its geographic, climatic, environmental, cultural, social and economic features, as well as its educational structures or human resources. The local resource potential (meaning not only local natural resources but also social, economic, educational, etc.) should be mobilized and gathered from the very beginning of any action plan. The 100% RE target and its related policy framework needs to be tailored to this particularity as this will ensure effective and rapid policy and project implementation.





Activate local resource potential

Mobilise local resources

Map stakeholders and their interests and identify existing engagement platforms and potential gaps for different stakeholders.

Organize workshops and roundtables to identify interests, roles, level of engagement, form coalitions, set up taskforces, engage different actors, start planning etc.

Identify programs for support and assistance

Identify programs, funds and supporting schemes (from local to international from across departments (energy, environment, economic development, social welfare, etc.) that might support your 100%RE transition.

Preliminary assessments

Identify the RE potential of your region.

Define geographical boundaries of the 100%RE area in transition.

Analyse energy consumption data and identify energy shares by source.

Identify GHG emissions by section.

Measure current Energy Costs.

Measure and quantify Externalities.



Develop the 100% RE Blueprint

DEFINE THE 100% RE TARGET

Formulating a target that is time-bound and measurable, and whose scope and political obligations are well-defined, is essential to developing and implementing a comprehensive and coherent 100% RE strategy.



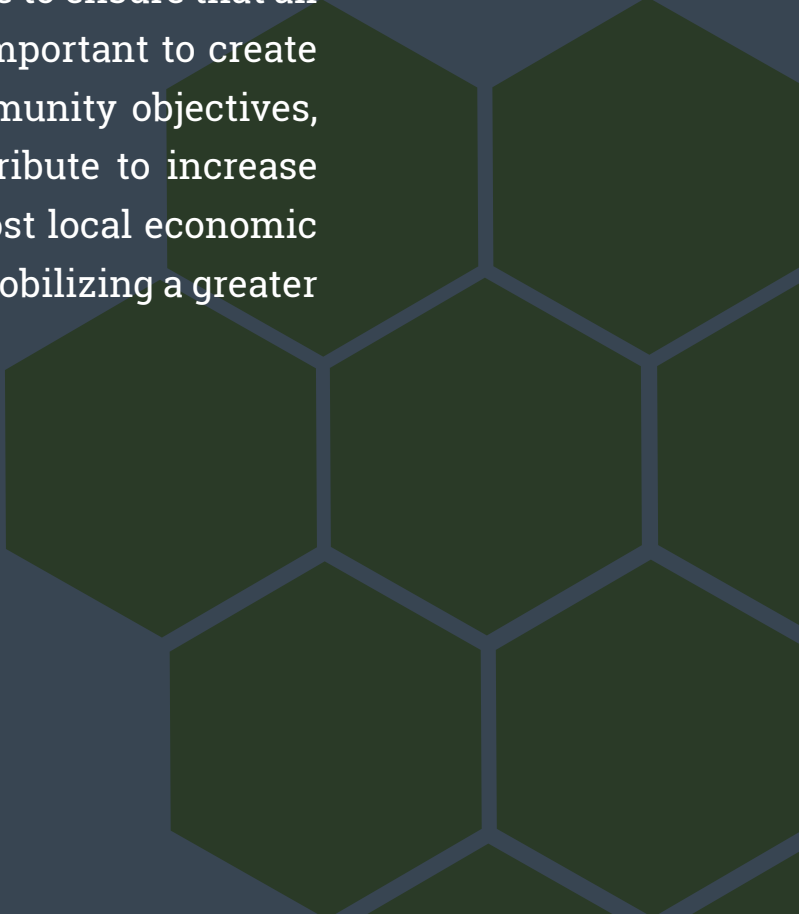
ESTIMATE THE POTENTIAL ECONOMIC, ENVIRONMENTAL AND SOCIAL BENEFITS

The results of the energy scenario can also help develop an estimation of the potential economic, environmental and social benefits that such an energy transition would entail. These should include specific estimates in terms of job creation, energy savings, local revenue production, opportunities for local industries, positive effect on human health, local air pollution, climate change mitigation potential and resilience.

MODEL A 100% RENEWABLE ENERGY SCENARIO

In parallel with defining the 100% Renewable Energy target, local authorities should engage local research centres to develop a credible energy scenario using computational modelling tools and other means of analysis such as economic cost-benefit analysis.

All the actors in a community should participate in shaping a shared and inclusive 100% RE blueprint and in doing so they can better understand how best to direct their own efforts. The 100% RE blueprint should be based on local potential and should be as inclusive as possible to ensure that all parts of society are involved and engaged. It is also important to create synergies between the 100% RE goals and other community objectives, for example how an energy transition can also contribute to increase community resilience against natural disasters or boost local economic development. Identifying such synergies can help in mobilizing a greater number of people to support the transformation.





Develop the 100% RE blueprint

Define the 100% RE target

Define what sectors are included in the target.

Explain how you calculate your RE shares.

Define your mid-term target / by 20__

Define your long-term target / by 20__

Define the scope of the target (e.g. community-wide, municipal operations etc.).

Define the role of public institutions, private entities, citizens, utilities and energy companies.

Model 100% renewable energy scenario

Identify potential partners in the region such as universities/research institutions to conduct the modelling.

Evaluate the infrastructural changes the scenario entails.

Explore opportunities to fund a 100% RE scenario.

Explore how the 100% RE scenario meet sustainability criteria.

Estimate potential socio-economic benefits

Calculate potential savings such as import of conventional energy and additional local revenues.

Explore short-term, mid-term and long term economic savings.

Define externalised costs of current energy system.



Formalize aims and functions

FIX BINDING TARGETS

After declarations that signal strong and widespread political commitment for the goal, it is essential that the 100% Renewable Energy target is legislated as binding and enforceable. Setting an ambitious, long-term renewable energy target demonstrates political commitment and provides investors, businesses, and residents with a clear long-term vision for the region, along with better understanding of how their roles within it.



DEFINE COMPREHENSIVE LEGAL AND REGULATORY FRAMEWORKS

Specific laws will need to come into force to ensure that all the other recommendations listed in the building blocks are indeed implemented. Any such law should support a decentralized, people-centred, participatory transition maximizing distributed, community-owned renewable energy systems.

ESTABLISH RELEVANT INSTITUTIONALIZED BODIES

Institutionalization also means establishing formal bodies or organizations to be responsible for designing, implementing and monitoring the transition towards achieving the target. These bodies should promote and facilitate multi-level governance, cross-sectoral collaboration and peer-to-peer cooperation between regions, cities and local governments. As an energy transition is a long-term endeavour, it needs to be well-rooted within a combination of institutional practices that are formal and informal.

Formalization of the transition means official, binding targets need to be set, policies and legislation need to be written into law, and specific institutions to supervise and drive the transition forward must be established.





Formalize aims and functions

Fix binding targets

Map existing policies for renewable energy.

Identify partnerships with other levels of government.

Identify legislative gaps and barriers.

Map overlapping and contradicting policies and legislations across sectors.

Define political mandate in energy policy of the particular jurisdiction.

Define comprehensive legal and regulatory frameworks

Identify gaps in the existing legislative framework to define potential additional laws and regulations to be implemented.

Identify laws and regulations that should be amended.

Map which stakeholders are addressed by the existing laws and policies.

Establish relevant institutionalized bodies

Set up institutional bodies responsible for a 100%RE transition across levels of government (e.g. commissions, taskforces, supervisory bodies, institutions).

Identify exemplary bodies in other jurisdictions.



Promote energy conservation and efficiency

CHANGE HUMAN BEHAVIOUR

A large decrease in energy consumption can come from non-technological measures that support a cultural focus on energy savings that lead to behaviour change. This can be done by promoting a culture of sustainability within the community, which is based not only on raising the level of awareness among citizens (e.g. through education and awareness campaigns) but also on increasing their level of engagement within their community.



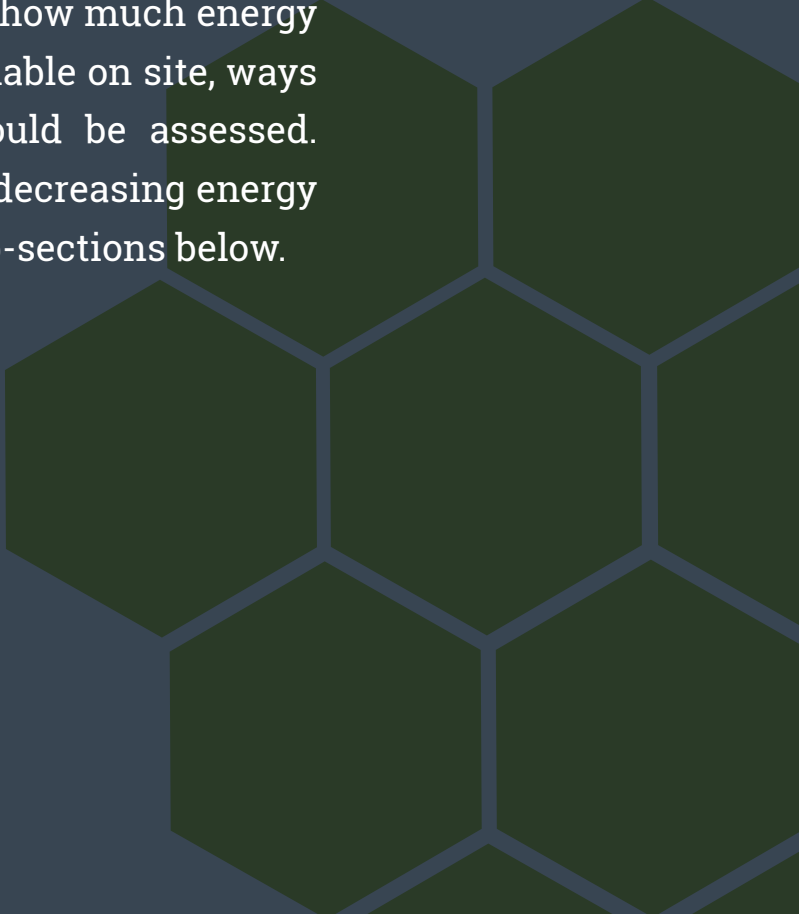
UPGRADE INFRASTRUCTURES AND SUPPORT EFFICIENT TECHNOLOGIES

By upgrading infrastructure, energy conservation can be achieved. Technologies that enhance energy efficiency and save energy through improvements in infrastructure and efficient technologies include cogeneration systems, district heating and cooling systems, decentralised electricity generation, smart grids and micro-grids, and recapturing industrial waste heat and other secondary heat sources.

RETROFIT EXISTING BUILT-ENVIRONMENTS

Considerable amounts of energy and carbon emissions can be saved by aggressively retrofitting existing buildings. Policies must establish strict standards for all new buildings and local governments should invest in retrofits of existing public building stock.

Energy efficiency and energy conservation represent core components of a sustainable 100% RE strategy. Prior to considering how much energy can be generated from renewable energy sources available on site, ways to significantly reduce current energy demand should be assessed. Generally speaking there are three key approaches to decreasing energy consumption, which are briefly summarized in the sub-sections below.

A decorative graphic consisting of a grid of dark green hexagons with thin, light blue outlines, located in the bottom right corner of the page.



Promote energy conservation and efficiency

Change behaviour

Engage your community in local decision making processes related to energy consumption and production.

Define projects and platforms to foster community engagement and education particularly on energy.

Map existing policy initiatives that target change of behaviour with in a community or society.

Retrofit existing built-environments

Identify percentage of your GHG emissions coming from buildings.

Define energy efficiency improvements to be implemented in buildings and its potential economic savings.

Define the kind of energy that is used in the built environment (e.g. embodied energy, operational energy, on-site generation, passive energy conservation etc.).

Identify winners and losers of efficiency measures.

Upgrade infrastructures and support efficient technologies

Identify inefficient infrastructures in your community.

Identify efficiency potential of sector integration and infrastructural changes.

Identify winners and losers of measures.



Increase and integrate RE across sectors

INCREASE RENEWABLE ELECTRICITY GENERATION

To develop a sustainable energy system that is meeting (or reducing) local energy demand, which itself varies hourly, daily, and seasonally, a smart, integrated use of RE, energy efficiency, demand management and energy storage technologies is necessary. Variable RE resources such as solar and wind play key roles for energy generation, as well as dispatchable renewables like bioenergy and hydropower.

MODERNIZE THE GRID AND OTHER INFRASTRUCTURE

Policies must support the integration of the technical and infrastructural changes needed to support an energy system fully powered by renewable energy sources. A policy framework will need to delineate clear actions to overcome the major technical hurdles specifically related to the flexible nature of RE and the necessary modernization of the energy grid.



TACKLE THE BUILT ENVIRONMENT CHALLENGE

The built environment improvements are key to achieving energy efficiency and savings in heating and cooling and electricity, and participation by private homeowners and business owners and employees is essential.

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For a jurisdiction to pursue 100% RE, there is the need to increase RE penetration across sectors (e.g. electricity, heating and cooling, and transportation) and to ensure that these are developed in an interconnected and integrated manner, as this rises the likelihood of achieving 100% renewable energy.





Increase and integrate RE across sectors

Increase renewable electricity generation

List ways to support the creation of new RE generation capacity.

Tackle the Built Environment Challenge

Support the creation of new RE generation capacity.

Improve energy efficiency (see overlaps with other building blocks).

Support Demand-Side Management and smart infrastructure developments.

Identify the role of different stakeholders in the current and future energy infrastructure.

Identify opportunities to integrate different sectors such as electrification of heating/cooling system to balance variabilities and enhance storage capacity.

Identify beneficiaries of a smart energy system and adapt finance mechanisms/ energy pricing.

Tackle mobility and transport challenges

Evaluate and assess your community's public transport system.

Encourage active mobility (walking and cycling), public transport and mix-use developments.

Evaluate the community's public transport system and analyse citizen's mobility behaviour incl. connection to surrounding regions/suburbs.

Modernize the grid and other infrastructure

Assess the implications of larger RE penetration in terms of storage capacity, demand side management and overall infrastructural upgrade.

Improve and enlarge power network infrastructure, storage options and demand side management solutions to accommodate larger RE shares.



Identify financial resources

INTRODUCE INNOVATIVE AND ALTERNATIVE FINANCING MECHANISMS

Although major investments in renewable energy infrastructure and technologies require consistent and reliable financial support from governments, local authorities also need to raise capital to support local projects. This is especially true for urban jurisdictions where little capital is available and there is strong dependence on central governments for financial support.



ESTABLISH STABLE, LONG-TERM SUPPORT SCHEMES

Create financial incentives that stimulate private investments and that encourage private individuals to opt for renewable energy options rather than conventional fossil fuels. Consistent financial support from national, regional and local governments is essential to develop the renewable energy market and to stimulate the necessary participation of companies and private individuals in moving this transition forward.

IMPLEMENT NEW MECHANISMS TO INTERNALIZE EXTERNALITIES

Promote adoption of innovative, locally-based fee systems, such as a carbon tax, waste tax or pollution tax, and other financial mechanisms to favour low-polluting in the marketplace alternatives over carbon and resource intensive processes.

Local actors need effective and innovative financial mechanisms to carry out a successful energy transition. Although major investments in renewable energy infrastructure and technologies require consistent and reliable financial support from governments, local authorities also need to raise capital to support local projects. This is especially true for urban jurisdictions where little capital is available and there is strong dependence on central governments for financial support. In fact, cities and regional governments are frequently mandated to solve complex problems without being allocated the financial resources to tackle them effectively. Furthermore, financial resources should not only be directed to renewable energy projects but also to energy efficiency given that a considerable decrease in energy consumption will be the essential condition to achieve a 100% RE future.



Identify financial resources

Introduce innovative and alternative financing mechanisms

Map existing financing mechanisms for building renewable energy infrastructure and implementing energy efficiency measures.

Identify finance gaps to achieve 100% RE target.

Map role of stakeholders (incl. citizens) in existing finance mechanisms and identify potential innovation.

Explore finance mechanisms implemented by other pioneering institutions with similar conditions.

Map political mandate of jurisdiction to develop new finance mechanisms.

Develop or identify decentralized fiscal policies.

Implement new mechanisms to internalize externalities

Introduce innovative and alternative financing mechanisms.

Establish stable, long-term support scheme.

Define long-term and stable support systems that encourage investments in RE and categorize them by "Energy Production", "Energy Efficiency" and "Consumption Reduction".



Support decentralization and inclusion

ENSURE ACCOUNTABILITY AND TRANSPARENCY

Holding politicians responsible and ensuring an environment of trust among community members and political authorities are essential to raising and maintaining public engagement. Accountability and transparency are fundamental aspects of an effective, inclusive and “future just” transition that ensures citizens are motivated to take ownership of the 100% RE system.



PROMOTE INCLUSIVE COMMUNICATION AND OUTREACH

Without a shift in awareness by the broader population, far-reaching energy transition processes cannot be launched. Citizens need to be involved in decision-making processes that lead to a shared 100% RE goal. Information and consultation raise citizen awareness to motivate energy conservation.

EMPOWER A DECENTRALIZED AND DIVERSIFIED ENERGY TRANSITION

The shift from a centralized energy system based on fossil fuels to one that is decentralized and run entirely on renewable energy sources requires citizens and communities to evolve into “Prosumers”—not just consumers but also producers of energy.

SAFEGUARD A SOCIALLY JUST TRANSITION

To guard against impacts of potential fall-off in traditional manufacturing and construction jobs, policies to enable families and businesses to alter their professions, business models and their consumption choices in responsive and effective ways must be in place.

A transition to 100% renewable energy will inevitably require a structural shift in how energy is produced, distributed and used. This paradigm shift entails a switch from a vertical to a horizontal structure. Most existing energy markets are characterized by complex centralized infrastructures and vertical supply chains and dominated by few big utilities; on the contrary, most future energy markets will be characterized by decentralized, horizontal supply chains with benefits that are widely distributed among new actors and stakeholders, including individual citizens and small businesses. The transformation towards a renewable energy-powered future is not the simple substitution of one fuel for another. It is more than that. It is a transition driven by the desire for more inclusive, democratic processes that enable all citizens to become champions and beneficiaries of their energy systems. A more equal, inclusive and fair society is an essential and necessary outcome of the transition towards 100% RE.

The transition to 100% RE entails a wide range of interventions that will inevitably affect all citizens. Whether it relates to household consumption, nutrition or mobility, almost all areas of life are touched by energy systems. Therefore, it is essential to mobilize and activate as many citizens as possible so they adopt this process as their own.



Support decentralization and inclusion

Ensure accountability and transparency

Evaluate how transparent the systems in place are and how this affects citizen's participation.

Develop mechanisms to ensure accountability and transparency.

Promote inclusive communication and outreach

Develop inclusive citizen consultation processes.

Define a communication strategy and identify channels to reach a diverse range of actors.

Assess beneficiaries and losers of the transition to 100% RE and align the communication message based on this analysis.

Empower a decentralized and diversified energy transition

Explore opportunities for new actors such as citizens to become active stakeholder (investor, owner, member etc.) in the energy system.

Support community-based cooperative models as part of the energy market.

Safeguard a socially just transition

Assess number and the kind of jobs in the conventional energy sector (direct and indirect) and define steps to facilitate a smooth transformation of traditional work forces.

Engage universities, vocational schools, education centers to assess potential of training measures for workers from the conventional energy system.

Assess socio-economic benefits of a decentralised, diversified energy system (see overlaps with other building blocks).

Map existing models for decentralised investment or decision making in other sectors and explore transferrability to energy sector.



Nurture vertical and horizontal cooperation and integration

FURTHER VERTICAL COOPERATION

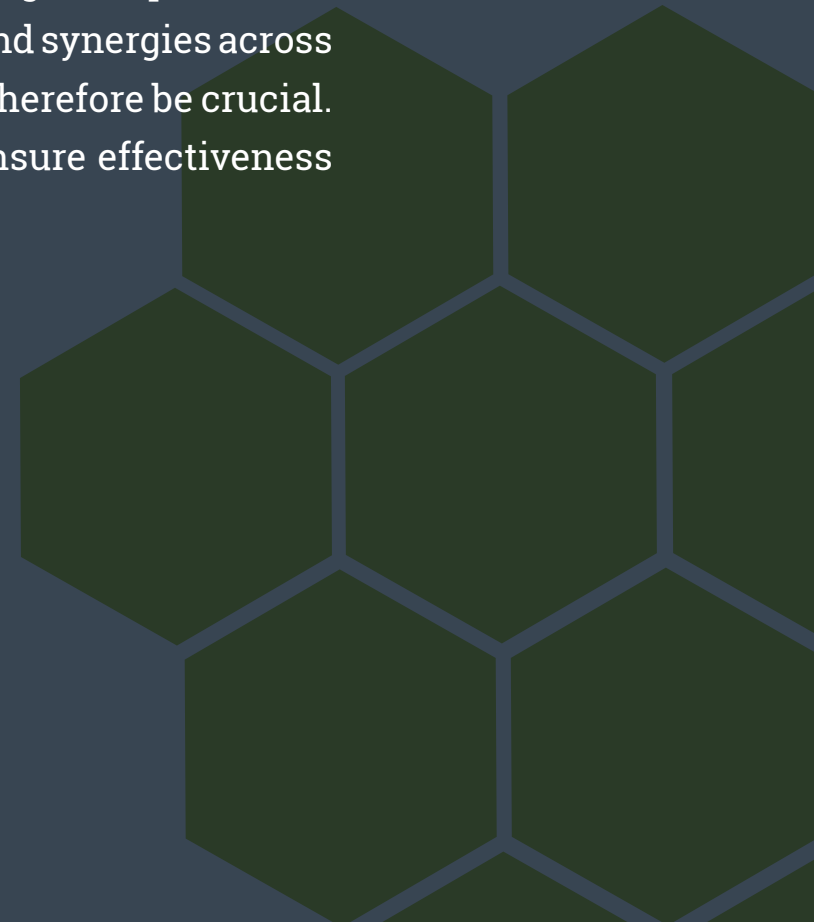
Cities, regions and sub-national governments cannot work in isolation and cannot achieve the 100% RE target without engaging the support across all levels of government. Building partnerships and intensifying coordination and collaboration throughout international, national, regional and local levels are critical actions to ensure policy coherence and integration.



CULTIVATE HORIZONTAL COOPERATION

It is important to make sure that the broadest possible coalition of actors is included in the process. Key actors within a local government's territory usually represent the administration, political parties, city managers, indigenous populations, business associations, citizen initiatives, research bodies, and so on. The more diverse the community participants in the 100% RE strategy are, the further reaching and reliable are the results.

The structural shift required to achieve 100% RE cannot be tackled by a single stakeholder or particular sector. Rather, it must be a collaborative effort built upon an alliance of stakeholders permeating all departments and different levels of local government. Cooperation and synergies across parties and across different levels of government will therefore be crucial. These collaborations should be institutionalized to ensure effectiveness and appropriate implementation.





Nurture vertical and horizontal cooperation and integration

Further vertical cooperation

Map existing partnerships with other governments and institutions on local, national, regional and international level.

Assess benefits of existing partnerships and potential gaps.

Establish formal structures (if not yet existent) to facilitate vertical cooperation.

Map needs for cooperation with other governments on national, regional and international level to achieve the envisioned goal.

Cultivate horizontal cooperation

Map existing partnerships with neighbouring jurisdictions as well as with stakeholders within the jurisdiction.

Assess benefits of existing partnerships and potential gaps.

Establish formal structures (if not yet existent) to facilitate horizontal cooperation.

Map needs for cooperation with neighbouring jurisdictions as well as with stakeholders within the jurisdiction to achieve the envisioned goal by defining different roles and functions.

Map political mandate of different public institutions within the jurisdiction and assess potential overlaps and gaps.



Promote knowledge generation and capacity building

GENERATE AND DISSEMINATE SPECIFIC KNOWLEDGE

A number of activities can accelerate shared learning between actors from both research and practice. For example, hosting demonstration and pilot projects to test an idea, becoming part of a research alliance, building a training centre, hosting educational programs, or ensuring a continuous process of evaluation and monitoring will all provide increased opportunities to share knowledge.



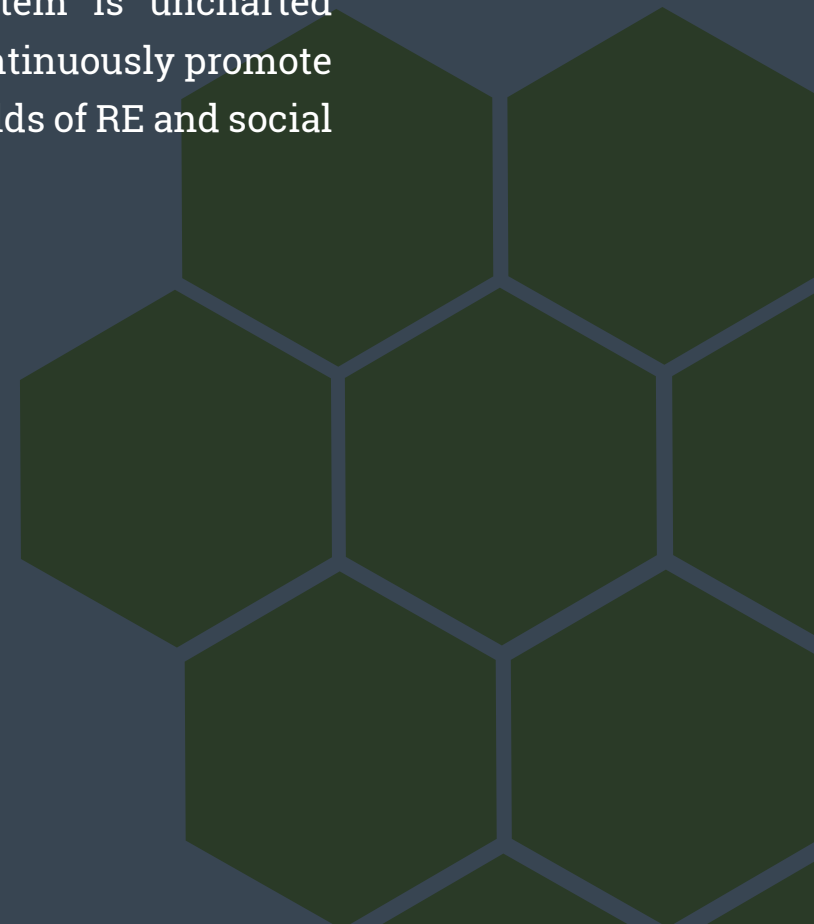
MAKE KNOWLEDGE AND DATA ACCESSIBLE

Policy makers and political leaders at the local level globally all stand to gain from a free and open exchange of lessons learned, best management practices and promotion of a further exchange of knowledge across jurisdictions, regions and countries around the world.

PROMOTE CAPACITY BUILDING AND TRAINING

This major restructuring cannot be achieved simply by swapping human capital and technologies, but by making sure that jurisdictions develop and reinforce their own local capacities and expertise that take advantage of their local human capital and fit their local contexts. Skills and training must be present or developed to support a structural transition of this scale and scope.

Transitioning towards a sustainable 100% RE system is uncharted territory. Therefore, it is crucial for jurisdictions to continuously promote knowledge generation and capacity building in the fields of RE and social innovation.





Promote knowledge generation and capacity building

Generate and disseminate specific knowledge

Establish projects frameworks that advance research and capacity building.

Develop activities and programs to facilitate knowledge sharing.

Map relevant stakeholders.

Make knowledge and data accessible

List tools where data and knowledge can be easily shared and accessed.

Develop a space where different actors can contribute into the common pool of knowledge.

Map role of stakeholders in existing tools.

Assess which data is needed by whom, who owns it and for whom it is accessible.

Promote capacity building and training

Develop and reinforce local capacities and expertise for necessary steps towards 100% RE.

Develop capacity building projects to support and train staff.

Define relevant capacities among different stakeholders.

Assess existing capacities and expertise in the jurisdiction.



Engage in networks

FORM AND ENGAGE IN LOCAL AND REGIONAL NETWORKS

At local or regional levels, interesting opportunities can often only be seized through common effort. Exchanging experiences and know-how with other local governments and civil society groups can enable leapfrogging and can even manifest in a joint wind or solar farm, for example.



PARTICIPATE IN INTERNATIONAL NETWORKS

Becoming part of an international networking platform not only supports constructive knowledge exchange and cooperation but can also enhance a local government's visibility and branding.

Membership provides opportunities to promote a city's or community's efforts, emboldening political leaders to partake in a common 100% RE planning process.

Whereas sustainability and transition projects at the community and local level often provide a sense of providing a mere “drop in the ocean,” connecting local actions with others can provide strong, comprehensive results. Linking motivated local actors and their efforts with accompanying regional, national, and international networks helps community and local leaders extend their pool of understanding as well as their reach and impact. The overarching idea is to incorporate as many effective solutions focused on a successful and sustainable 100% RE transition. By widening and accelerating the learning capacity of a community, they allow for a more rapid transition to the community’s desired energy system. To support jurisdictions, particularly on their transition to 100% RE by facilitation of peer-learning and knowledge exchange, members of the Global 100% RE campaign have initiated the Global 100% RE Regions and Cities Network which includes cities and regions such as Australia Capital Territory (Australia), Jeju Province (South Korea), Vancouver (Canada), and Växjö (Sweden).



Engage in networks

Form and engage in local and regional networks

Define potential networks with other local and regional jurisdictions.

Define potential networks with local civil society groups.

Define potential networks with the private sector.

Map needs for engaging in local and regional networks.

Map existing networks, the role of their members and potential gaps.

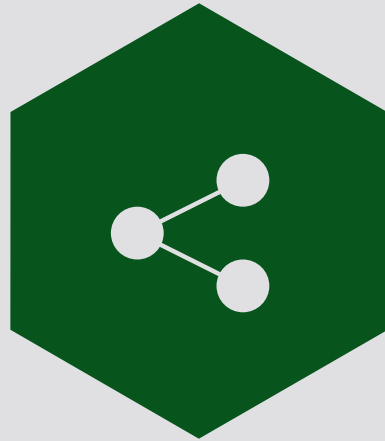
Define suitable focal point within the jurisdiction for the network.

Participate in international networks

Map needs for engaging in international networks.

Map existing networks, the role of their members and potential gaps.

Define suitable focal point within the jurisdiction for the network.





We need to change the narrative.
Instead of a call-to-arms, we need a doctrine
of “mutually assured survival” – a doctrine in which all
commit to the goal of 100% renewable energy.”


Andrea Reimer, Director on the Metro Vancouver Board of Directors, Vice Chair of
Metro Vancouver Climate Action Committee, Councilor with the City of Vancouver.



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