Key principles for improving the support to strategic energy planning in developing and emerging economies

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Statement of the Principles

Strategic energy planning is an essential input to effective policy and investment decision-making. It involves the use of evidence and a robust set of assumptions for the future to identify the energy needs of a country or region, and broad pathways for meeting these needs in ways that satisfy strategic goals for energy access, energy security, climate action and environmental protection. Energy goals that are clear, evidence-based, and widely agreed can help align the incentives and actions of key stakeholders* towards achieving these wider developmental and social objectives. Currently, support for planning processes is often too fragmented to be effective, and as a result the actions of key market players become misaligned. Rapid global changes in energy systems are making decisions more complex, but, at the same time, they are creating opportunities for low-income countries to diversify the way energy is supplied and used. These **global energy sector shifts make it all the more important that decision-makers have access to good evidence about energy needs and possible pathways across the whole energy system** in order to avoid the risk of locking in to inappropriate long-lived infrastructure.

This document sets out five **key principles** for the definition of a "Code of Conduct" for Development Partners to work collectively towards improved effectiveness of their support to country governments on strategic energy system planning, in line with the 2005 Paris Declaration on Aid Effectiveness:

National ownership. Support country-led energy planning processes that work in partnership with key stakeholders* to achieve broad consensus on strategic objectives and plans. Help empower the relevant authorities at regional, national and subnational level to rally stakeholders to implement the plan, and push back on proposals that do not align.

Coherence and inclusivity. Assist Governments to ensure that strategic decisions taken in the energy sector are coherent with broader economic, social and environmental goals (including Sustainable Development Goals and Nationally Determined Contributions under the Paris climate change agreement) by committing to evidence-based, integrated and inclusive energy planning processes that lead to fair and technically sound energy development programmes.

Capacity. Support Governments in the definition of priority capacity building activities which strengthen the capability of national institutions to take the lead on strategic energy planning. and incorporate plans and evidence into decision-making and implementation processes. Commit to coordination of Development Partners on the basis of the Government's vision, requests and goals and avoid fragmentation and duplication of efforts.

Robustness. Promote the use of models, analysis and decision-support tools that have strong technical and economic foundations, are fit-for-purpose to deal with rapidly changing circumstances in the energy sector, are able to support flexible and adaptive approaches to energy sector planning, and can be easily and regularly updated.

Transparency and accessibility. Promote open access to and review of planning inputs (data, model design and assumptions) and encourage the accessibility of planning outputs to key stakeholders, subject to government restrictions and commercial confidentiality constraints.

Signatories to these principles commit to incorporating them in their working practice.

* Key stakeholders are defined as governments, government agencies, consumers/citizens and civil society organisations, utilities, investors, project developers and international development partners.

Annex A. Explanation of the Principles

1 Purpose and vision of the principles

The vision behind these principles is to improve the coherence of the support provided to long-term strategic decision-making in the energy sector by increasing the coordination among key actors and the effective use of evidence and analysis. Although the main stakeholders are government decision-makers (with inputs from civil society, private sector and other energy sector actors), energy planning is often supported by a mix of bilateral and multi-lateral donors and Development Partners (DPs), with inputs from technical institutions and consultancy firms providing data and analysis using a variety of software tools and models, as well as varying degrees of capacity building. Nevertheless, current support to planning activities is too often ineffective at improving decisions-making, for the following reasons:

- **Key stakeholders – leaders, policymakers, and investors – often do not buy in to plans that they had no role in developing**, exacerbated by lack of technical capacity to undertake their own analysis. Decision-making processes will be more prone to politicisation when evidence-based planning is marginalised.

- **Planning is often motivated by assessing individual projects in the pipeline, rather than developing a coherent vision for the energy sector as a whole.** Often, too much emphasis is given to supply-side issues, and not enough to energy demand or wider system integration. For instance, electricity and cooking or heating challenges are rarely addressed jointly within a comprehensive domain.

- **Models and especially data sets are not always adequate to robustly address issues arising from global energy transition trends**, including shifts to modern forms of cooking or heating, integration of variable renewables, greater electrification in the economy, and the role of smart grid and distributed generation.

- **Donor support is often fragmented, with multiple studies siloed between different technical themes, and little coherence or strategic alignment of the energy system as a whole**. A lack of joined-up capacity-building efforts and procurement procedures leads to poor continuity and inhibits sharing of data sets, tools, and models.

- **Platforms and collaborations between international technical institutions to share data, tools and models, where they exist, have gaps and are hard to navigate**.

The principles set out in this document were developed through a roundtable consultation process drawing on the experience of organisations involved in implementing and supporting energy planning (listed in Annex B). The 'Roundtable' process is an initial step towards addressing the above barriers. The principles are evolving, and will adapt as the coalition builds. In particular, further work is required to identify how the principles and approach set out here can be adapted to address gender and social inclusion (GESI) aspects and to apply specifically to Fragile and Conflict Affected States (FCAS).

2 Elaboration of the principles

National ownership

Support country-led energy planning processes that work in partnership with key stakeholders to achieve broad consensus on strategic objectives and plans. Help empower the relevant authorities at regional, national and subnational level to rally stakeholders to implement the plan, and push back on proposals that do not align.

Strategic energy sector planning is deeply political by nature, and energy sector choices ultimately need to be taken by politically accountable authorities. Ownership of energy planning processes has therefore been identified as one of the most important principles that should guide work in this area. Country leadership is essential in aligning and agreeing across actors the priority objectives for the energy sector.

Strong country-owned energy plans have benefits in terms of improving legitimacy and accountability, and helping countries avoid being overly driven by lobbying and special interests. Multi-stakeholder inclusivity in the planning process should be encouraged whenever it is reasonable and applicable for the specific planning output.

Energy plans must be updated on a regular basis to factor in changing circumstances, further necessitating that governments own the planning process and have the technical capacity to regularly update and review planning decisions.

There is also a role for regional organisations to provide high-level evidence and peer-to-peer support and coordination, including evidence and coordination on improving system integration of different generation types and appropriate levels of regional generation capacity.

Coherence and inclusivity

Assist Governments to ensure that strategic decisions taken in the energy sector are coherent with broader economic, social and environmental goals (including Sustainable Development Goals and Nationally Determined Contributions under the Paris climate change agreement) by committing to evidence-based, integrated and inclusive energy planning processes that lead to fair and technically sound energy development programmes.

Improving the coherence of strategic decisions has been identified as a critical need in the energy sector. Good energy planning processes allow data and other quantitative evidence to be packaged in suitable ways, allowing it to be channelled into decision-making processes.

Done well, country-owned energy plans should improve clarity both for investors and for development partners, enabling them to develop a clear and consistent vision, avoiding a piece-meal approach, *ad-hoc* policy decisions, and duplication or contradictory forms of support and investment.

Three types of coherence are important. Firstly, **strategic coherence** requires a range of interlinked objectives to be considered and prioritised, explicitly recognising trade-offs and tensions:

- **Social equity**, which is affected through choices about implementation pace, prioritisation and subsidies, and geography of energy access improvements of different communities and regions of the country;

- **Economic growth, the pursuit of the Sustainable Development Goals (SDGs) and climate National Determined Contributions (NDCs)**, including considerations on the economic and energy needs of different sectors to drive a low-emission and climate-resilient development, including the role of grid, off-grid, and other technical issues for meeting business energy needs while fully grasping the opportunities offered by a sustainable and green growth;

- **Fiscal policy**, the constraints of national debt for public energy sector expenditure, and the questions of stimulation of domestic capital formation and prevention of large-scale financial outflows;

- **Energy security** and its implications for domestic stability, international relations, and regional economic integration, e.g. on choices about the level of energy imports and exports;

- **Fossil fuel resource extraction**, affecting inter- and intra-generational equity, as well as its incompatibility with the Paris Agreement's goal of holding the increase in global average temperature to well below 2°C above pre-industrial levels and pursuing efforts towards limiting it to 1.5°C;

- **Environmental impacts**, including impacts of climate change on energy infrastructure, and impacts of **environmental policies** such as climate, efficiency, and renewables targets; and

- **Land, food, air, energy, industry, water nexus** trade-offs that arise from different energy choices, implying potential risks, but also substantial co-benefits according to the energy pathways chosen.

Secondly, **technical coherence** requires that decisions made at sub-sectoral level are broadly compatible with whole-system plans and that integrated approaches with a balanced attention to the supply and demand of energy and consideration of the least-cost principle are followed. This includes decisions about: ways to reliably model energy demand for a multitude of final uses (e.g. electricity, heating, cooling, cooking) according to development plans; the relative roles of grid, mini-grid, and stand-alone systems; integration of a high level of penetration of variable renewable energy and the need for system flexibility; how to address the emergence of electric vehicles and storage; the emergence of vibrant off-grid private sector companies; and regional planning and the role of cross-border trade. These all require varying degrees of state-level decisions to be taken. The current period of systemic change in global energy systems means that now, even more than before, the multiplicity of actors (ministry, regulator, utility, on-grid and off-grid developers, grid operators, civil society, public donors, private investors) makes it necessary to have good planning and clear objectives for the sector, as well as improved coordination.

Thirdly, **organisational coherence** requires coordination between decision-makers dispersed across different organisations and functional levels, including:

- **Policy & strategy level** decision-makers responsible for the direction and pace of energy sector developments, the prioritisation of competing strategic concerns, and balancing trade-offs/creation of winners and losers between different groups of stakeholders;

- **Mid-level planning** undertaken by specialised energy or planning units of relevant ministries and other public bodies, such as regulators, who need evidence on the costs and benefits of different options and investment proposals; and

- **Project design and operational** planning carried out by project developers, utilities, and system operators, who need a high degree of technical detail, but also coherence with the system as a whole.

Capacity

Support Governments in the definition of priority capacity building activities which strengthen the capability of national institutions to take the lead on strategic energy planning. and incorporate plans and evidence into decision-making and implementation processes. Commit to coordination of Development Partners on the basis of the Government's vision, requests and goals and avoid fragmentation and duplication of efforts.

A country-led approach to capacity building needs to **address countries' ability to**:

- **Improve** the strategic, technical, and organisational coherence of energy plans;
- **Update** plans and respond to changing circumstances on the ground;
- **Incorporate** plans and other evidence in the decision-making process;
- **Implement** energy plans ensuring there are appropriate systems in place for setting milestones, tracking progress, and troubleshooting roadblocks, and/or delays.

Externally funded capacity-building efforts in relation to energy planning are often disparate, and consequently fail to align or build on existing national planning structures and processes. These efforts are often driven by external priorities rather than institutional needs assessments of the countries themselves. **There needs to be improved coordination by donors and technical institutions to tailor training programmes and other forms of capacity building such as secondments, study visits, and curricula review/development to the needs of countries**, building on existing planning tools and processes that were previously applied in a country where possible, rather than a vested agenda or a 'one size fits all' approach.

Countries should be supported to identify capacity gaps across the energy sector and relevant institutions (government, utilities, regulators, universities, and technical institutions), and to develop a roadmap for building long-term national knowledge and skills base.

International organisations can often help provide decision-support tools and capacity building to ensure that the right kind of evidence is available to decision-makers. However, much of the value comes from the planning process itself, and countries need the capacity to keep these processes dynamic. **Written plans or documents coming out of the process will have limited value unless they can be regularly updated and allow decision-makers to adapt to changing facts on the ground**, such as technology costs and availability, and market conditions. Critically, the process also requires review of policies and regulations to align them with the vision and enable implementation of the energy plan.

Robustness

Promote the use of models, analysis and decision-support tools that have strong technical and economic foundations, are fit-for-purpose to deal with rapidly changing circumstances in the energy sector, are able to support flexible and adaptive approaches to energy sector planning, and can be easily and regularly updated.

Quantitative analysis using models or decision-support tools helps to structure data and evidence, and helps different stakeholders transparently reveal, discuss, and evaluate their assumptions, and come to a common understanding. Scenarios or projections help analyse how the energy system might evolve in the future, drawing on available evidence. Variables can include the likely future levels of energy demand, and the costs, technical characteristics including the long-term lifespan of energy infrastructure, environmental impacts, financial consequences, socio-economic changes (e.g. in jobs, sectoral demand etc.) associated with different energy pathways, and risks of different supply options.

Different types of models or tools may be used, depending on the type of evidence needed to support particular decisions. For example, system-level choices (such as grid vs. off-grid electrification, the role of imported technology, short-term variability and grid integration of renewables vs. long-term capacity expansion) will require different analytical tools from project-level investment choices (e.g. choice of generation technology) or operational decisions (e.g. dispatch order for power plants, regulatory decisions on tariffs). Whole-system models can give an overview of the overall needs of the sector, which is useful for sector budgeting and ensuring consistency of subsector plans. Tools and models that are interoperable and accessible will help planners choose the right analytical approach for the questions they need to address. Figure 1 outlines some examples of different types of modelling approaches.

Where possible, **tools and models used should be best-in-class, while recognising that evidence needs to be tailored to the needs of decision-makers at different organisational levels**:

- **Policy-Level.** Evidence to support decisions and facilitate coordination between ministries needs to be presented in a suitable, high-level format, such as scenario analyses of the strategic consequences of different energy options.

- **Mid-level planning.** Tools and models need to provide more detailed analyses of different system design options, including techno-economic assessments of specific projects in the pipeline and geo-spatial analyses that can help specify requirements for the procurement phase. Regulators may also need to have their own capability to assess different energy development options.

- **Project/plant design and operation.** Project-specific tools may include, for example, engineering design software used to specify and procure new power plant construction, and system operation tools for determining project feasibility or dispatch/merit order of electricity plants. This type of energy planning function may be undertaken by state-owned energy utilities or other specialised planning agencies, institutes, universities, or consultants.

Transparency and accessibility

Promote open access to and review of planning inputs (data, model design and assumptions) and encourage the accessibility of planning outputs to key stakeholders, subject to government restrictions and commercial confidentiality constraints.

A pre-requisite to applying the above four principles is accessibility of data, and transparency regarding the quality of data and assumptions. For some parts of the energy system, good data already exist (e.g. solar and wind resources), while in others there are significant gaps (e.g. biomass resources and consumption). In all cases, there is a need to improve the accessibility of data for planners. **This requires action to help planners navigate best-in-class data from different sources, and to improve the interoperability of different data sets by developing and harmonising data standards.** In some cases, policy changes may also be required to empower national energy planning authorities to obtain the information they need: for example, from private utilities, independent power producers, and international energy companies.

It is also essential that planners ensure transparency regarding the quality of data and assumptions that they use, so that they can assess the likely range of possible values of important variables that affect their planning decisions.

The international community should promote the use and sharing of data and assumptions on open or easily accessible platforms, as well as the use of open-source software for models and decision-support tools when possible and if relevant. **The pursue of data transparency and accessibility does not imply disregarding the rights of public and private entities to commercial confidentiality or national security.** Measures should be put in place to protect sensitive information where appropriate. However, where those sensitivities are not applicable, transparent and accessible data and information should be the rationale to follow.

Annex B. List of entities involved in the 'Roundtable' process

The following list includes entities involved in the 'Roundtable' dialogue process up to and including the Third Roundtable Discussion held in February 2019 in Cape Town. The dialogue process is open to new organisations who wish to engage and promote the use and dissemination of the principles, and all such organisations are welcome to become signatories to these principles.

TYPE	ORGANISATION	ACRONYM
Donors / DFIs	African Development Bank	**AfDB**
	Agence Française de Développement	**AFD**
	Department for International Development (UK)	**DFID**
	Deutsche Gesellschaft für Internationale Zusammenarbeit	**GIZ**
	Energy Sector Management Assistance Programme	**ESMAP**
	European Commission	**EC**
	Fondazione Eni Enrico Mattei	**FEEM**
	International Finance Corporation	**IFC**
	Islamic Development Bank	**IsDB**
	UN Institute for Economic Development and Planning	**UN IDEP**
	UN Department of Economic and Social Affairs	**UN DESA**
	UN Development Program	**UNDP**
	UN Economic Commission for Africa	**UN ECA**
	US Agency for International Development	**USAID / Power Africa**
	US Department of State	
	World Bank Group	**WBG**
Practitioners and technical agencies	Columbia University	
	Danish Energy Agency	
	Energy Systems Catapult	
	Facebook	
	Institut du Développement Durable et des Relations Internationales	**IDDRI**
	International Atomic Energy Agency	**IAEA**
	International Energy Agency	**IEA**
	International Institute of Applied Systems Analysis	**IIASA**
	International Renewable Energy Agency	**IRENA**
	Kartoza	
	Massachusetts Institute of Technology: Energy Initiative and Center for Energy and Environmental Policy Research	**MIT (CEEPR)**
	National Renewable Energy Laboratory	**NREL**
	Netherlands Development Organisation	**SNV**
	Open Tools, Integrated Modelling and Upskilling for Sustainable Development Community of Practice	**OpTIMUS**
	Oxford Policy Management	**OPM**
	Politecnico di Milano	
	Power for All	
	Practical Action	

	Renewable Energy Policy Network for 21st Century	**REN21**
	Rocky Mountain Institute	**RMI**
	Royal Institute of Technology – Sweden	**KTH**
	Stockholm Environment Institute	**SEI**
	Sustainable Energy for All	**SEforALL**
	University of Cape Town	**UCT**
	University of Mauritius	
	World Resources Institute	**WRI**