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# Strategy Roadmap

## Development of National Low-Emission Development Strategy (LEDS) in Yemen

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# Development of National Low-Emission Development Strategy (LEDS) in Yemen

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# Strategy Roadmap

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## Section I: Introduction

### Purpose of the LEDS Strategy Roadmap

- 1- The purpose of this roadmap is to demonstrate a framework of national-led process for developing of contextualized national LEDS strategy. In addition, it aims to contribute towards enabling Yemen strengthening its climate finance readiness. Furthermore, this roadmap develops a framework for development of national LEDS by conducting situational analysis and then building upon useful information of related national sustainable development strategies, climate change document and studies including national communication processes.
- 2- The strategy roadmap outlines a forward-looking national mitigation outlook. This roadmap also contributes towards strengthening understanding regarding implications of LEDS process in terms of achieving Yemen's commitment related to sustainable development strategies. LEDS is one of the sustainable development strategies which promotes transformative, coordinated, and balanced development paths while at the same time contributes towards GHG emission abatement, poverty reduction, and pro-poor economic growth.
- 3- In the interim, this road map can therefore serve as a preliminary policy framework for development partners to support national GHG mitigation scenario options and priorities.

### Forward-looking Low-Emission Strategy: background, imputes, goals and functions

- 4- LEDS first emerged under the United Nations Framework Convention on Climate Change (UNFCCC) in 2008 within the Bali Action Plan. Then, the Copenhagen Accord and Cancun Agreement emphasized that LEDS is an indispensable sustainable development strategy. Before moving forward in the discussion, it is useful to have a common understanding about differences of key terms in this roadmap which includes LEDS, and NAMAs.
- 5- In simple words, LEDS is a forward-looking national development strategy which involves low-emission and socio-economic growth options. In essence, LEDS are development focused document which outlines medium and long-term national priority low-emission investments. Key elements of LEDS may include assessment of GHG emissions, and projects over the next 15-30 years, proposal of alternative priority policy actions, implementation and financing mechanisms. Although, National Communications usually involves such elements, but it should be born in mind that national communications basically are reporting instruments rather than as a development plan or strategy.
- 6- Typically, the national LEDS presents emission mitigation options and their respective underlying costs and benefits, laying a foundation for Nationally Appropriate Mitigation Actions (NAMAs) for non -Annex I countries. Under the UNFCCC, development of LEDS by LDCs including Yemen is a voluntary process. Nevertheless, LEDS has on the other hand co-benefits making it worth doing: First, LEDS as a sustainable development strategy- it defines a process of transition towards low-emission development paths. Second,

LEDS as an enabling activity- It enables Yemen increasing the likelihood of Yemen becoming well-positioned to harness potential funding opportunities than otherwise would.

- 7- With the growing international green, climate change financing opportunities, and establishment of the Green Climate Fund (GCF), Yemen has an opportunity to access such opportunities. However, the potentiality to gain access to such opportunities is constrained by several reasons which limit the country capacity to tap into these tremendous funding opportunities. LEDS is among the main readiness framework elements which need to be developed to strengthen its potentiality to tap into the international climate financing.
- 8- The process of developing LEDS should be synergetic and build upon existing and underway national development planning and reports. National Communications and other development plans/strategies such as Rural Electrification Policy or National Renewable Energy Strategy should be referred to as a basis for developing the LEDS. NAMAs on the other hand are like a sectoral action plans for implementing priority mitigation options which lead to accomplishment of the national low-emission objective of LEDS. In general, LEDS serve specific functions and goals. The following summarizes key potential functions, and goals of a typical LEDS:
  - Identify mid- and long-term mitigation objective
  - Identify country-driven policy priorities for short- to medium-term mitigation actions in key sectors including NAMAs
  - Identify emission reduction potential of mitigation actions
  - Provide estimates of the costs and benefits of possible future emission reductions
  - Identify barriers to implementing mitigation actions and means to address them
  - Identify support needs and priorities
  - Explain the strategy to finance strategies
  - Explain lead agency in charge of implementing action and managing financing

## Section II: Situation Analysis

### Setting a broader national socio-economic context

- 9- As a Least Developed Country (LDC), Yemen is facing numerous socio-economic and environmental challenges. Economically, Yemen is a low-income country and depends mostly on declining oil resources which accounts for about 25 percent of Gross Domestic Product (GDP), and roughly 70 percent of government revenues. The latest estimated GDP - per capita (PPP) is about US\$ 2,700 (World Bank 2010). The average growth rate for non-oil GDP reached 5.3 percent. Although oil contributes substantially to GDP, it does not provide much employment. Agriculture, on the other hand, employs 54 percent of the population, and is the mainstay of 74 percent of the rural population, while only accounting for at best 15 percent of GDP.

- 10- About 75 percent of population in Yemen lives in rural areas, and mainly relies on access to natural resources for constructing their livelihoods through engaging in activities such as farming, grazing, wooding, and fishing while –as mentioned earlier- lacking access to basic services such as electricity, safe water and sanitation, health and education. Poverty is expected to increase due to disease spread, declining access to water and decreasing agriculture productivity, or even asset destruction. Furthermore, natural resources based are vulnerable to impacts of climate change including water, agriculture, coastal zones, and many resources. The country has witnessed increasing intensity and frequency of extreme events such as floods, and drought causing impact on the livelihoods posing pressure leading deterioration of livelihood conditions, and humanitarian diseases.
- 11- The Human Development Report (HDR 2011) ranks Yemen 154th among 177 countries on its Human Development Index (HDI). Yemen is classified as the poorest country in the Middle East and reportedly seems that meeting the Millennium Development Goals (MDGs) by 2015 will be unlikely (Yemen MDGR 2010). High population growth, slow economic growth, high unemployment, environmental degradation, climate change, high inequalities between rural-urban, gender disparities, lack of adequate access to basic service including education (i.e. high illiteracy rate, low enrollment and school drop-out), health (i.e. high child malnutrition, maternal mortality), electricity, gender disparities, widespread poverty, political and security concerns, continuing weak governance including absence the culture of the rule of law, and non-conducive and inefficient delivery mechanism remain as the key obstacles for achieving substantial progress on the way towards sustainable development compared to those outlined since the last national report prepared for Rio+15.
- 12- Climate change risks are projected to further impede the national capacity to achieve sustainable development but even worse in the sense that reversing development progressed in the past. It worth-mentioning that, the recent political unrest in the country has further slowed down progress towards sustainable development. The pro-longed national economic stagnation coupled with business retrenchment, and limited access to basic services including water, health, education, electricity, and security has been driving the higher rates of unemployment, poverty and ill-being in the country. Nevertheless, the National Dialogue Conference calls for transformation through which to foster and lay out foundation and basis for peaceful power transition and more conducive environment supportive for effective and efficient governance of limited resources of the country.

### **Related national institutional, and policy background**

- 13- Yemen has been a Party to the UN Framework Convention on Climate Change (UNFCCC) since 21 February 1996, and to the Kyoto Protocol since 17 January 2008 as non-Annex I Party. The Environmental Protection Authority is the national focal point for the implementation of the UNFCCC and the Kyoto protocol. Since the ratification and application of the UNFCCC and the Kyoto Protocol, considerable efforts have been made in establishing legislation, institutional and policy frameworks in order to fulfil the requirements of the Convention and the Protocol. Fundamental steps have been initiated to integrate environmental, social and economical factors at policy and legal levels.

- 14- The environmental policy including the National Environmental Action Plan (NEAP), and the National Strategy for Environmental Sustainability (NSES) specify the major environmental concerns and highlight constraints which include capacity building of institutions to actively implement climate protection policies and meet the obligations of international agreements such as UNFCCC. The National Capacity Self Assessment (NCSA) was conducted and national capacities for implementing the commitments under the UNFCCC identified. However, with external support, and as a part of its commitment under the UNFCCC, Yemen has prepared the First National Communication (INC), and submitted the Second National Communication (SNC) in 2012.
- 15- Under the Kyoto Protocol, the Clean Development Mechanism (CDM) has been institutionalized, and potentiality promoted. The National Adaptation Programme of Action (NAPA) was prepared. The National Strategy for Climate Change Resilience under the Pilot Programme for Climate Resilience (PPCR) prepared, and implementation has been initiated. Climate change was mainstreamed into key developmental and sectoral policies including agricultural as well as fishery sectoral development strategies. Adaptation to the impact of climate change has been already initiated. Adaptation is a priority in Yemen, and a number of adaptation programmes either being implemented and a number are still pipelined.
- 16- On the other hand, a number of sectoral mitigation interventions have already been implemented, and some are pipelined but never tap into climate finance potentials such as Clean Development Mechanism (CDM) under Kyoto Protocol for which they are well-qualified. For instance, although Yemen is undertaking phased-based Natural Gas fuel conversion investments known as Marib- Gas Turbine powered energy generation plants which have substantial CDM finance potential, the opportunity has not been tapped. Although CDM institutional setup up is already operational, national climate finance readiness is generally far weak. As noted by the previous policy article entitled as “**A Framework to Strengthen National Climate Finance Readiness in Yemen**”), a national low-emission long-term strategy is non-existent.
- 17- Also, Yemen has not yet designated a dedicated national institution (i.e. NCF) for administering climate change policies and strategies through which a broader mandate and capacities are necessarily required to capture and address the multidisciplinary, and inter-sectoral developmental challenges induced by climate change. In addition, institutional structures for NAMA have not yet designated as well. As indicated earlier, development of NAMAS is not compulsory but rather voluntary, and NAMAs demonstrates commitments to transition towards greener economy.
- 18- It worth pointing out that there is a unique feature of NAMAs in terms of climate financing in comparison with CDM. CDM finance typically stipulates certain conditions including the so-called additionality as a requirement for an investment to qualify for Certified Emission Reductions (CERs). Unlike CDM, NAMAs can be supported through international financing and CDM eligibility criteria do not apply. As noted above, a number of sectoral climate change-related mitigation interventions in Yemen have been already initiated and implemented in a scattered manner, while at the same time lacking a strategic framework for realizing their full potential to achieve an intended transformational impact.



## Section III: Yemen's LEAD Development Roadmap and Action Plan

This section explores the framework of LEDS to provide a context in developing LEDS in Yemen. The first sub-section deals with the roadmap while the second outlines the action plan.

### LEDS Development Roadmap

This sub-section puts together the main framework elements through which to lead a nationally-led process for developing a full-fledged LEDS in Yemen. This roadmap draws upon applicable UNDP experiences around the world in general, and LDCs in particular, while at the same time streamlines the various technical analytical tools to support the process taking advantage of related existing national strategies, reports, information, as well as available expertise at the national level. The road map will spot light on applicable institutional barriers to likely impede the process and reduce the feasibility of implementations. The following demonstrates a framework for development of nationally-driven LEDS in Yemen which includes the following main LEDS strategy framework stages and elements:

- **Scoping and planning:** In the this stage, stocktaking analysis and review of national development policies, strategies and programmes has to be undertaken to determine scope, objectives, identify synergies, avoid duplicated work, and ensure consistency with overriding national development priorities, need, and goals. The scope and objectives of institutional arrangements to lead, and coordinate the development and implementation of the LEDS have to be clearly determined. Policy-maker, and stakeholder consultation is an important step. It helps securing political support to the LEDS development, and implementation processes. The goal, objectives, process, and multi-sectoral policy implications of the LEDS have to be developed, shared through proper consultative mechanisms in order to promote ownership, and secure nationally-led consensus-based decision-making process from the very beginning.
- **Developing baseline and mitigation scenarios:** Establishing base year (reference year- by year of last updated GHG levels, baseline scenario, and low carbon economic growth scenario) is the second stage in LEDS process. The baseline scenario is the existing national policy where no mitigation measures are undertaken. The mitigation scenario is the low GHG emission paths in which LEDS interventions are undertaken. The LEDS impact is the difference between the two scenarios. IPCC Guidelines provide through methodology for conducting GHG emissions, and developing the indicated reference and mitigation scenarios. There are several analytical tools that can be used to assess GHG emissions for both scenarios. An obligation of quantifiable GHG emission reduction targets compared to reference or base year (i.e. 2000, when the latest GHG inventory was conducted) should be defined in this stage in consultation with stakeholders. An important consideration is to ensure that GHG emission reduction targets (i.e. 10-15 percent) in regards to the base year has to be reasonable over the medium (i.e. by 2030), and long-term (i.e. 2050) timeframes to be designated.
- **Determining mitigation options in the key sectors:** After baseline and mitigation/abatement scenarios are developed, and quantifiable GHG emission reduction target is defined, then mitigation options have to be explored and assessed. In this stage, concrete national appropriate mitigation actions (NAMAs) of specific sector need to be explored and determined. Several tools are available to assist in identifying sectoral mitigation potentials to reach the emission reduction targets in a cost-efficient manner. For instance, cost-benefit analysis assists in assessing the various options, and identifies priority measures based on their



potentiality to reduce emissions (i.e. meet target) with lower cost possible. On the other hand, mitigation policy instruments (i.e. fiscal instruments: removing of climate non-friendly subsidies; regulation: carbon taxation; economic: access to funding, and subsidy) need to be explored in this stage to encourage the implementation of the mitigation options. Cost-effectiveness analysis is a powerful tool in assessing policy options, and determines the priority policy options. An important note to consider in this stage that proper planning with appropriate timeframe for introduction of proposed mitigation measures is necessarily essential to ensure financial and institutional feasibility of the new measures. For instance, defining of ambitious GHG emission reduction targets will likely to make negative impact of economic growth of the country besides the huge investments to meet the obligation. As such, this policy note emphasizes that LEDS has to contribute to the ultimate goal of the socio-economic development strategies which is poverty reduction. Restoring and accelerating economic growth in Yemen will be critical in the short term, and is a prerequisite for human development in the long term. The LEDS in any way attempts to contribute towards that goal, and taking into a perspective the deployment of proper analysis tool to discard options that may impede or slow down economic growth within the pursuit of sustainable development framework

- **Financing mitigation measures, and Monitoring, Reporting, and Verification (MRV):** In this stage, domestic, and international financial resources to support the LEDS mitigation measures needs to be explored. Analysis of climate finance readiness in Yemen and a framework for improvement were prepared by UNDP Yemen Country Office and have been explored in more details. As mentioned earlier, and in contrary to CDM projects, NAMAs by LDCs including Yemen are a voluntary exercise, while at the same time can be supported by international financial, capacity building, and technological support under Bali Action Plan. However, those NAMAs which need to be supported by international funding need to be clearly flagged. For internationally supported NAMAs, an international standard of MRV applies. More information on MRV was also provided in the aforesaid UNDP Yemen Country Office's publication on Yemen climate finance readiness.

### LEDS development action plan

This sub-section elaborates reflects on the aforementioned framework through deliberate review of national processes, methodologies, reports, as well as other relevant information in the pursuit of existing national sustainable development strategies. This review helps establishing a context of synergies for optimizing the process of LEDS development in Yemen drawing on available information which have been produced by national communication processes, and other sustainable development policy documents which includes for instance National Biodiversity Strategy and Action Plan, Yemen's National Environmental Action Plan, Joint Social and Economic Assessment for the Republic of Yemen, National Strategy for Environmental Sustainability, Rio+20 National Report, National Renewable Energy Strategy, as well as Rural Electrification Strategy. Table 1 below demonstrates action plans to develop LEDS in Yemen.

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**Table (1): Yemen's LEDS Development Action Plan**

Roadmap stages	Main roadmap stage elements	Status	Recommended actions
<b>Scoping and planning</b>	<b>Vision/goal and scope</b>	Yet, a vision of the LEDS is non-existent. The scope of LEDS has not yet been determined. Whether a full-fledged policy or sectoral has not been explored.	Define the scope, and vision of the LEDS in consultative manner
	<b>National circumstances</b>	National circumstances influence policy planning and implementation priorities. The SNC has conducted a thorough assessment of national circumstances in 2010. However, the implications of the recent political changes in new realities on the ground including the national dialogue need to be reflected.	Update national circumstances, and economic development priorities to capture recent political changes induced by the youth protest for change since early 2011.
	<b>Lead agency</b>	There is no designated national institution in charge of coordinating the development, and implementing of the LEDS. At present, the Environmental Protection Authority (EPA) is the focal point of UNFCCC, and in charge of coordinating donor-finance climate change interventions. EPA is the national institution in charge of coordinating and oversight, and enforcement of Environmental law, and international environmental conventions. However, options were explored in earlier UNDP policy note including the potentiality of the Social Fund for Development to host a National Climate Fund (NCF) to coordinate, and manage national climate change policy as an interim arrangement to on strengthen national readiness to climate finance	Designate a national implementing agency of LEDS in a consultative manner
	<b>Reference year</b>	The latest GHG inventory as of the year of 2000 was conducted by the SNC	Define the reference year in regards to the mitigation action according to the latest GHG inventory. The

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			reference year of latest GHG inventory will be updated in Third National Communication (TNC)
<b>Developing baseline and mitigation scenarios</b>	<b>GHG baseline Emission levels</b>	A baseline scenario of GHG of the reference year of 2000, and projections until 2025 was established in the SNC	Update the GHG baseline Emission levels in the TNC
	<b>GHG mitigation emission levels</b>	A mitigation scenario of GHG of the reference year of 2000, and projections until 2025 was established in the SNC	Establish LEDS mitigation scenario capitalizing on the planned update of GHG mitigation emission levels in the TNC
	<b>Quantifiable emission reduction targets</b>	The SNC indicated that the mitigation scenario is projected to reduce GHG by about 14 percent compared to the reference year of 2000 if implementation initiated in 2012.	Verify the emission reduction target of the LEDS in consultation with stakeholders in light of recent national circumstances, and economic growth policy priorities, and targets building on the TNC process, and update. Also, the emission targets should be defined for the periods up to 2020, and 2030 and 2050 as applicable.
<b>Determining mitigation options in the key sectors</b>	<b>Emission reduction options, and potentials</b>	The SNC identified mitigation options in various economic sectors which include transport, energy, household, agriculture, industry, and solid waste. However, the priority sectors which accounts for the majority of emissions are transport household, and industry due to their high energy consumption as well as	Communicate NAMAs, to the UNFCCC secretariat (Refer to appendix I outlining potential NAMAs of Yemen.

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		low efficiencies. In addition, assessment of potentiality of mitigation options, and priority options with higher mitigation potentiality was identified as well in the SNC. A GHG mitigation framework for implementing of the identified priority options was also explored. The indicated mitigation options are typically Nationally Appropriate Mitigation Actions (NAMAs). As an LDC, Yemen can declare these NAMAs by submitting to the UNFCCC secretariat, and flag those which need to be internationally financed. It worth mentioning that the implementation of a number of the identified mitigation options (i.e. Marib Gas Turbine Power Stations, Phase I, and II) was already initiated, but yet Yemen has not communicated this progress to the UNFCCC secretariat under NAMAs by LDCs.	
	<b>Mitigation costs</b>	Although mitigation potentials were identified in the SNC, the potential cost of implementing the priority options has not yet estimated.	Estimate potential costs of mitigation actions capitalizing on the TNC process
<b>Financing mitigation measures, and MRV implementation</b>	<b>Finance of mitigation implementation</b>	The SNC identified barriers, and constrains of the mitigation implementation including lack of funding. As an LDC, Yemen has several developmental challenges and pressing priorities. However, as explored in the aforementioned UNDP CO policy note, Yemen needs to strengthen its readiness to climate finance which would provide an opportunity to the country to achieve win-win outcomes.	Strengthen national readiness to climate finance by establishing a NCF

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## Appendix (I)

### Nationally Appropriate Mitigation Actions (NAMAs) of Yemen

Policy Options	Sector	Specific Actions
Renewable Energy	Electric power generation	<ul style="list-style-type: none"> <li>- Switching to Natural Gas, Geothermal , Biomass, Wind and Solar Electric Power Generation Plants</li> </ul>
Energy Efficiency	Household	<ul style="list-style-type: none"> <li>- Rural Electrification for Lighting</li> <li>- Efficient Lighting using compact fluorescent lamp (CFL)</li> <li>- Efficient Refrigeration</li> </ul>
	Transport	<ul style="list-style-type: none"> <li>- Switching Diesel Lorries to Gasoline ones</li> <li>- Switching Diesel Buses to Gasoline ones</li> <li>- Improved Vehicle Efficiencies</li> </ul>
	industry	<ul style="list-style-type: none"> <li>- Fuel switching to Natural Gas specifically in cement industries</li> </ul>
	Commercial	<ul style="list-style-type: none"> <li>- Fuel Switching to Natural Gas specifically in bakery-fired systems</li> </ul>
	Agriculture	<ul style="list-style-type: none"> <li>- Switching to Solar Pumps in Irrigation Systems</li> </ul>