

PROPOSED TOOLS FOR MAINSTREAMING CLIMATE CHANGE ISSUES INTO AZERBAIJAN'S ENERGY POLICY

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ABSTRACT

Climate change is affecting the global environment mainly through greenhouse gas emissions, largely caused by energy-related industries. International organizations and countries have been therefore making efforts to consider this problem in their policies by re-defining their policies and strategies towards 'low-emission' concept, thus, linking climate change with energy-related policies and strategies. This challenge requires cohesive activities incorporating societal, economic, and technical aspects. Mainstreaming, or adapting, climate change issues into macro level sectors including energy sector have been therefore scholarly studied and applied, particularly by various international organization in the context of assisting governments in adapting climate change.

This paper examines the various methodological approaches on adapting climate change issues into energy policies of countries, and the best practices of countries that mainstreamed climate change issues into their energy policies. Based on the analysis of existing approaches and tools for mainstreaming climate change agenda into energy policy, the author discusses and proposes the potential tools for mainstreaming climate change issues into Azerbaijan's energy policy.

The paper has the following structure: (i) The link between climate change and energy policy; (ii) Methodological frameworks and approaches in mainstreaming climate change into energy policy; (iii) Potential tools for mainstreaming climate change issues into Azerbaijan's energy policy. The paper was prepared within the framework of the consultancy work for the United Nations Development Program's project "Developing guidelines on mainstreaming climate change and gender concept into the energy policy for Azerbaijan" in 2021-2022.

Keywords: energy, policy, climate change, mainstreaming, emissions

INTRODUCTION

Climate change is affecting the global environment mainly through greenhouse gas emissions, largely caused by energy-related industries. International organizations and countries have been therefore making efforts to consider this problem in their policies by re-defining their policies and strategies towards 'low-emission' concept, thus, linking climate change with energy-related policies and strategies. This challenge requires cohesive activities incorporating societal, economic, and technical aspects. Mainstreaming, or adapting, climate change issues into macro level sectors including energy sector have been therefore scholarly studied and applied, particularly by various international organizations in the context of assisting governments in adapting climate change.

This paper examines the various methodological approaches on adapting climate change issues into energy policies of countries, and the best practices of countries that mainstreamed climate change issues into their energy policies. Based on the analysis of existing approaches and tools for mainstreaming climate change agenda into energy policy, the author discusses and proposes the potential tools for mainstreaming climate change issues into Azerbaijan's energy policy. The paper was prepared within the framework of the consultancy work for the United Nations Development Program's project "Developing guidelines on mainstreaming climate change and gender concept into the energy policy for Azerbaijan" in 2021-2022.

DATA

Climate change and energy policy

The term “climate change” has been among the most discussed topics of the humanity globally since 20th century. Despite the definition by various organization, the term “climate”, contextually, has similar meanings in all definitions (selected), as described in below table:

Table 1. Definition of climate change

Organization/source	Definition
United Nations [1]	<i>“Climate change refers to long-term shifts in temperatures and weather patterns. These shifts may be natural, such as through variations in the solar cycle. But since the 1800s, human activities have been the main driver of climate change, primarily due to burning fossil fuels like coal, oil and gas.”</i>
National Geographic [2]	<i>“Climate change is the long-term alteration of temperature and typical weather patterns in a place. Climate change could refer to a particular location or the planet as a whole. Climate change may cause weather patterns to be less predictable. These unexpected weather patterns can make it difficult to maintain and grow crops in regions that rely on farming because expected temperature and rainfall levels can no longer be relied on. Climate change has also been connected with other damaging weather events such as more frequent and more intense hurricanes, floods, downpours, and winter storms.”</i>
NASA[3]	<i>“Climate change is a change in the usual weather found in a place. This could be a change in how much rain a place usually gets in a year. Or it could be a change in a place's usual temperature for a month or season. Climate change is also a change in Earth's climate. This could be a change in Earth's usual temperature. Or it could be a change in where rain and snow usually fall on Earth. Weather can change in just a few hours. Climate takes hundreds or even millions of years to change.”</i>
Britannica[4]	<i>“Climate change, periodic modification of Earth's climate brought about as a result of changes in the atmosphere as well as interactions between the atmosphere and various other geologic, chemical, biological, and geographic factors within the Earth system.”</i>

While the climate change could happen due to natural reasons, it has become a hot agenda since 20th century due to the massive human impact on the nature during industrial (mid-1700s to mid-1800s) and post-industrial (after mid-1800s) periods. Extensive use of fossil fuels and deforestation have contributed to heat-trapping of greenhouse gases, causing so-called “global warming”.

COP21 Paris convention of the United Nations Framework Convention on Climate Change [5] drafted an agreement that for the first time signaled that both developed and developing nations will strive to undertake action on climate change and report on related progress. The Paris Agreement “aims to strengthen the global response to the threat of climate change ... by: Holding the increase in the global average temperature to well below 2^oC above pre-industrial levels...”. Key elements of the agreement include:

- *“Each party shall prepare, communicate and maintain successive NDCs that it intends to achieve.”*

- “Each party shall communicate NDCs every five years.”

The nationally determined contributions (NDCs) provide important signals on government expectations related to the general direction and pace of likely policy initiatives to address climate change risks. In this regard, the following key messages were highlighted in the United Nations Environment Program’s (UNEP) Emissions Gap Report 2021 issued in October 2021[6]:

- *To align with a 1.5°C limit, global CO2 emissions must reach net zero around 2050, with global GHG emissions reaching net zero 15–20 years later. A delay of 15–20 years in either net-zero CO2 or net-zero GHGs implies limiting warming to 2°C rather than 1.5°C.*
- *The emissions gap remains large: compared to previous unconditional NDCs, the new pledges for 2030 reduce projected 2030 emissions by only 7.5 per cent, whereas 30 per cent is needed for 2°C and 55 per cent is needed for 1.5°C. Global warming at the end of the century is estimated at 2.7°C if all unconditional 2030 pledges are fully implemented and 2.6°C if all conditional pledges are also implemented. If the net-zero emissions pledges are additionally fully implemented, this estimate is lowered to around 2.2°C.*

Despite being a traditional oil and gas country, the Republic of Azerbaijan has been more actively focusing on climate change matters the energy sector during the last decade, particularly in the last five years, cognizant of the global trends and developments in overall energy and climate change issues. After joining the United Nations Framework Convention on Climate Change and Kyoto protocol, Azerbaijan has implemented a number of measures to mitigate the impact of climate change by supporting international initiatives and efforts for combating climate change. The country periodically submits relevant reports to the UNFCCC.

In October 2016, the Government of Azerbaijan established a National Coordination Council for Sustainable Development (NCCSD). The main objective of the Council is to align national programs and priorities with the Sustainable Development Goals (SDGs). The Secretariat of the Council is hosted by the Ministry of Economy. The Deputy Prime Minister of Azerbaijan is officially appointed as Chair of the Council and the Minister of Economy as Deputy Chair. Other ministries and state bodies are mainly represented at the level of deputy ministers. At the same time, it should be mentioned that the Ministry of Energy of Azerbaijan Republic is not represented at the Council despite the fact that *SDG 7: “Ensure access to affordable, reliable, sustainable and modern energy for all”* and *SDG 13 “Take urgent action to combat climate change and its impacts”* are directly related to the energy sector.

On 28 October 2016, the Milli Mejlis (the Parliament of Azerbaijan) ratified the Paris Agreement with the country’s commitment to reduce GHG emissions by 35% in 2030. Therefore, the national target of Azerbaijan, set as an intended nationally determined contribution (INDC), is a *35% reduction of GHG emissions by 2030* compared to the base year 1990. In absolute values, the country should achieve total emissions reductions equal to 25.7 MtCO_{2e} excluding land use, land-use change and forestry (LULUCF) activities or 24.4 MtCO_{2e} when including LULUCF compared to 1990.

The Second Biennial Update Report of the Republic of Azerbaijan submitted to the UNFCCC in September 2018 does not stipulate the breakdown of the target per sector. At the same time, the report indicates that 79.6% of total emissions in 2013, the year of the last inventory, were emitted by the energy sector, as shown in the Table 2.

Table 2. Dynamics of GHG emissions and absorptions per sectors in Azerbaijan, 1990–2013 (MtCO_{2e})[7][8]

	1990	2000	2005	2010	2011	2012	2013	2030 (target)	2013- 2030
Energy	63.9	33.0	39.2	36.6	46.2	47.8	49.2	-	-
Industry	1.4	0.6	1.8	2.1	2.3	3.4	3.4	-	-
Agriculture and forestry	6.3	5.4	6.5	7.2	8.2	8.5	8.5	-	-
Waste	1.7	1.8	2.0	2.3	0.7	0.7	0.8	-	-
Total emissions	73.3	40.8	49.5	48.2	57.5	60.3	61.8	47.7	-14.2
<i>% of previous period</i>	-	-44%	21%	-3%	19%	5%	2%	-23%	-
Removal	-3.7	-4.9	-5.3	-5.4	-7.4	-7.8	-8.0	-2.4	5.6
Net emissions	69.6	35.9	44.1	42.8	50.0	52.6	53.9	45.3	-8.6
<i>% of previous period</i>	-	-48%	23%	-3%	17%	5%	2%	-16%	-

The table suggests that that Azerbaijan further needs to reduce its total emissions by 23% by 2030 to achieve its INDC target compared to the latest available data of 2013 as indicated in the report. There is no official action plan on the activities aimed at achieving GHG (greenhouse gas emission) targets.

The link between climate change and energy policy

The main source of greenhouse gas emissions globally is energy sector (produced and emitted), accounting for the almost three-quarters of all emissions, as indicated in *The World Energy Outlook 2021* prepared by the International Energy Agency[9]. This certainly makes the energy sector as the paramount factor for global emissions. In this context, the energy and climate change have been in close ties since the pre-industrial era. Given the expected incline in the use fossil fuels in the future, as well as very positive impact of green energy sources on the environment, it is important to analyze the future links between the energy and climate change.

Overall, growing energy demand, economies of scale and growing air pollution and health concerns will provide further stimulus for shifting the energy sector to renewable energy at global level. In addition, increasing action on climate change and the environment, and the growing global trend of divesting fossil fuel assets are expected to further accelerate the transition to renewables and efficiency across the world. Energy shift and/or transformation is also a path of opportunity. It would enable faster economic growth, create more jobs, and improve overall social welfare. It would bring annual savings by 2050 of between three and seven times the additional annual costs of the transition. By 2050, the energy transformation would provide a 2.5% improvement in GDP and a 0.2% increase in global employment, compared to business as usual [10].

The technological progress and relevant continuously changing lifestyles of population increases the energy demand across the globe with environmental consequences. This requires the governments and organizations to always consider the technological progress and climate change issues in dealing with future energy demand outlooks, coupling energy and climate change in their assessments. On the other hand, the COVID-19 pandemic emerged in early 2020 has almost affected all areas of energy consumption of humanity, contributing positively to climate change in some cases (i.e. stagnation of economies, total collapse in tourism sector, etc.). In this context, the author has reviewed several available energy outlook related reports of international organizations and companies to provide key insights for the period of up to 2050.

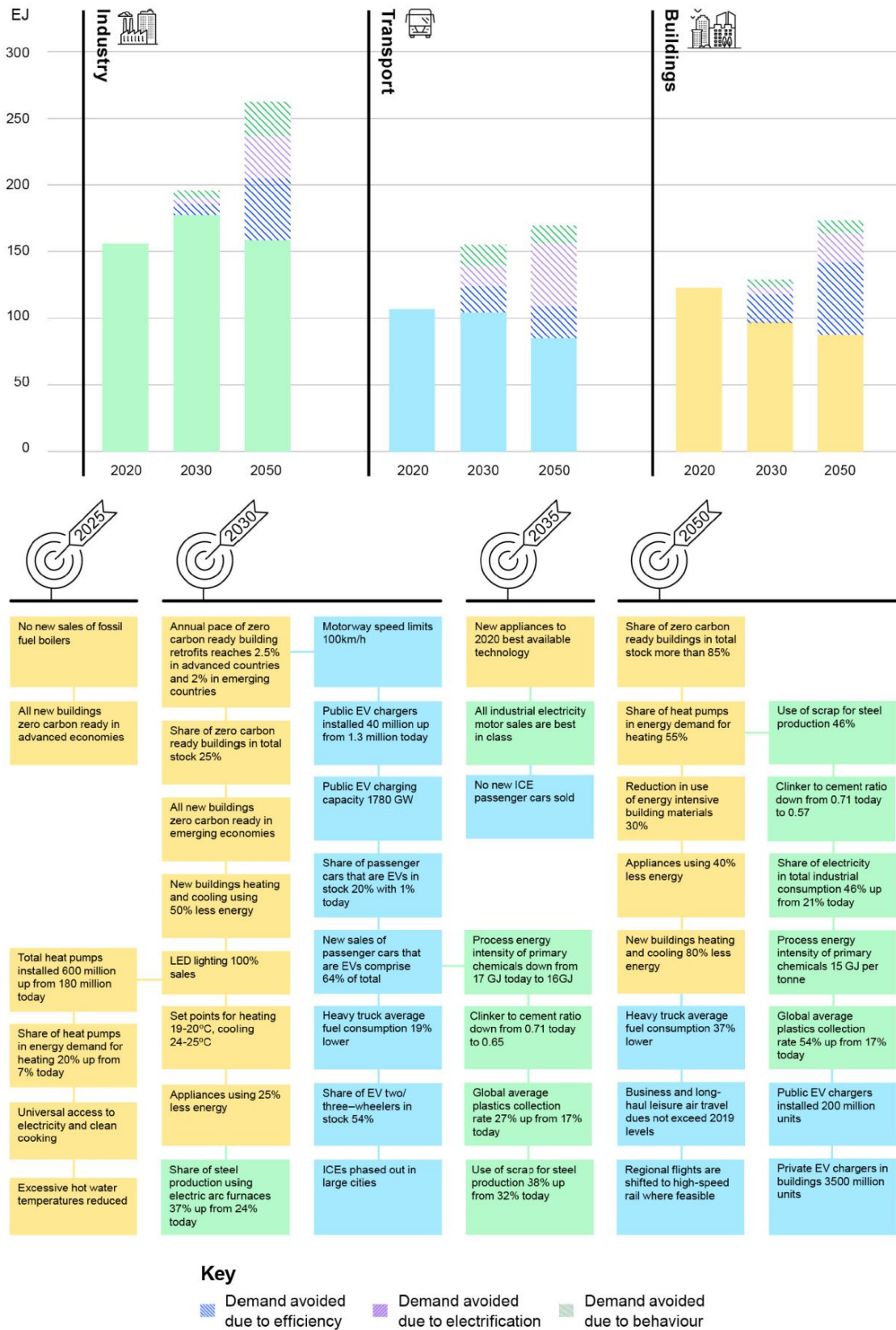
The World Energy Outlook 2021 contains the following key insights for the period of up to 2050:

- In 2020, even while economies bent under the weight of Covid-19 lockdowns, *renewable sources of energy such as wind and solar PV continued to grow rapidly, and electric vehicles set new sales records* – The new energy economy will be more electrified, efficient, interconnected and clean. Clean energy technology is becoming a major new area for investment and employment – and a dynamic arena for international collaboration and competition.
- However, every data point showing the speed of change in energy can be countered *by another showing the stubbornness of the status quo* – The rapid but uneven economic recovery from last year’s COVID-induced recession is putting major strains on parts of today’s energy system, sparking sharp price rises in natural gas, coal and electricity markets. For all the advances being made by renewables and electric mobility, 2021 saw a large rebound in coal and oil use. Largely for this reason, it is also seeing the second-largest annual increase in CO2 emissions in history.
- *Pressures on the energy system are not going to relent in the coming decades. The energy sector is responsible for almost three-quarters of the emissions that have already pushed global average temperatures 1.1 °C higher since the pre-industrial age, with visible impacts on weather and climate extremes. The energy sector has to be at the heart of the solution to climate change.*
- The Report highlights four key measures that *can help to close the gap between today’s pledges and a 1.5 °C trajectory over the next ten years* – and to underpin further emissions reductions post-2030. More than 40% of the actions required are cost-effective, meaning that they result in overall cost savings to consumers compared with the pathway in the Announced Pledges (APS). The four measures are the followings:
 - A massive *additional push for clean electrification* that requires a doubling of solar PV and wind deployment relative to the APS; a major expansion of other low-emissions generation, including the use of nuclear power where acceptable; a huge build-out of electricity infrastructure and all forms of system flexibility, including from hydropower; a rapid phase out of coal; and a drive to expand electricity use for transport and heating.
 - *A relentless focus on energy efficiency, together with measures to temper energy service demand through materials efficiency and behavioral change*
 - *A broad drive to cut methane emissions from fossil fuel operations*
 - *A big boost to clean energy innovation*

Another valuable report by the International Energy Agency is the *Energy Efficiency 2021*[11]. The key highlights from the report are presented below:

- *Energy efficiency trends are expected to return to their ten year average after the worst year in a decade* – However, the rate of improvement needs to double from current levels to match the gain outlined in the IEA Net Zero Emissions by 2050 Scenario.
- In the IEA Net Zero Emissions by 2050 Scenario, an early policy focus on energy efficiency would triple the number of jobs created by 2030 through increased spending on building retrofits, more efficient appliances and other measures. This includes many jobs in construction, as well as installation of heating, cooling and hot water systems.
- In the Net Zero Emissions by 2050 Scenario, the energy intensity of the global economy falls by 35% by 2030. This Scenario also involves more than 40 energy efficiency milestones without which total final energy consumption would be around 30% higher by 2030.

Figure 1. Energy efficiency milestones in the Net Zero Emissions by 2050 Scenario, 2020-2050[11]



Note: EV = electric vehicle; ICE = internal combustion engine vehicles.

“The Global Energy Transformation: A Road Map to 2050” Report by the International Renewable Energy Agency [10] focuses on the global energy transformation from renewable energy perspectives considering energy sustainability and climate change issues. The Report has the following highlights pertinent to the topic of this study:

- *Electrification with renewable energy can start to reduce energy-related carbon dioxide (CO₂) emissions immediately and substantially.* The pairing is also getting cheaper than fossil fuel-based alternatives, lowers local air pollution and increases health benefits, results in positive socio-economic benefits and will be a key enabler to build a connected and digitalized economy and society. Electrification, when paired with renewables, goes hand-in-hand with energy efficiency, resulting in lower overall energy demand.
- *By 2050 electricity could become the central energy carrier, growing from a 20% share of final consumption to an almost 50% share – and, as a result, gross electricity consumption would more than double.* Renewable power will be able to provide the bulk of global power demand (86%). Overall, renewable energy would supply two-thirds of final energy.
- *Annual energy-related CO₂ emissions decline 70% below the 2019 level.* An estimated 75% of this reduction can be achieved through renewable energy and electrification technologies; if energy efficiency is included, then this share rises to over 90%. The report shows that emissions would need to be reduced by around 3.5% per year from now until 2050, with continued reductions after that time.
- *Technology is progressing rapidly, and solutions exist today that are deployable at large scale and are increasingly cost-competitive.* Governments should align climate and sustainability targets with energy plans, and they should value these plans beyond just the effect on the energy sector and take a more holistic, socio-economic view.
- *Systemic innovation is crucial as a key enabler for the energy transition.* Countries need to devote more attention to enabling smarter energy systems through digitalization, through the coupling of sectors via greater electrification, and by embracing decentralization trends..

As to European Union (EU) commitments and targets in the field of emissions, it has the binding climate target for reducing net GHG emissions by at least 55% by 2030 compared to the 1990 level. The EU has also set the target to be a climate-neutral by 2050[12].

The Government of Azerbaijan has made the following ambitious goals for the recent COP26 Glasgow meeting[13]:

- *40% reduction in GHG emissions by 2050*
- *To increase the share of renewable energy sources in total installed capacity of electricity from current 17% to 30% by 2030*
- *Net-zero emission goal by 2050 for the territories liberated from Armenian occupation*

The Government of Azerbaijan has joined the following initiatives during COP26:

- Glasgow Leaders Declaration on Forest and Land Use
- Green Grids Initiative – One Sun One One World One Grid
- A Call for Adaptation and Resilience and the Adaptation Action Coalition
- Global Ocean Alliance
- The Glasgow Breakthrough Statement
- Declaration of Zero Emission Vehicles
- Global Coal to Clean Power Transition Statement
- Powering Past Coal Alliance

- No New Coal Power Impact

The latest activities on cooperation with international organizations on climate change related energy sector issues in Azerbaijan includes the followings:

- *EU4Energy program of European Union and the International Energy Charter:* Since 2019, within the framework of the EU4Energy program of European Union and the International Energy Charter, the development of the National Action Plan on Energy Efficiency has been started.
- *Framework Convention on Climate Change and Kyoto Protocol:* Azerbaijan joined the Framework Convention on Climate Change and signed the Kyoto Protocol. The Country also approved the Sendai Framework and is aiming to increase the use of alternative and renewable energy sources. As the proof to the transition to greener energy, Azerbaijan has set the target to reduce greenhouse gas emissions by 35 percent by 2030 under the Paris Climate Agreement.

Climate change mitigation and adaptation issues were prepared for national economy and main economic sectors and described in strategic road maps approved in 2016, other than the Strategic Road Map on Utilities (including electricity, gas, heat and water)). Issues related to climate change mitigation are described in several documents:

- *Strategic Road Map for development of heavy industry and machinery in the Republic of Azerbaijan;*
- *Strategic Road Map for manufacturing and processing agricultural products in the Republic of Azerbaijan for the period up to 2025 and forth.*

Strategic Road Map for manufacturing and processing agricultural products has *Strategic target 7. Environmental protection, sustainable use of natural resources and management of the impact of natural factors on agriculture.* To achieve this target 2 actions were set up:

- Action 7.2.2: Reduction of carbon dioxide emissions in the agricultural sector – Measures to reduce carbon dioxide emissions in plant and animal husbandry will be considered to promote the collection of methane gas from farm-generated manure and the use as renewable energy. Livestock development activities in the country will be aligned with greenhouse gas emissions reduction measures.
- Action 7.2.6: Assessment of the transition potential of the green economy in the agrarian sector and the use of alternative energy sources in the heat supply of greenhouses – Assessment of the potential transition to a "green economy" in the sector. Greenhouses will be encouraged to use organic compost. The possibilities of using solar collectors, biogas and thermal water resources in the heat supply of greenhouses will be investigated and the possibilities of their application will be considered.

UN Framework Convention on Climate Change Evaluation

The latest evaluation of the UN Framework Convention on Climate Change application[7] in Azerbaijan was prepared in 2010. Based on this study the main sources of CO₂ emissions in Azerbaijan are the energy and industrial sectors. CO₂ emissions in the Energy sector are accumulated from the burning of fuel including in the production of energy, oil and gas extraction, transport, and human settlements.

2030 Agenda for Sustainable Development (2030 Agenda)

As part of the 2030 Agenda for Sustainable Development (2030 Agenda), the UN - Azerbaijan Sustainable Development Cooperation Framework (UNSDCF) 2021-2025 is developed and supports the main strategy of the UNSDCF. The UNSDCF sets the strategic vision and direction for cooperation between the Republic of Azerbaijan and the United Nations Country Team (UNCT) for the period of 4 years from 2021 to 2025 years.

The UNSDCF proposes a roadmap to ensure that Azerbaijan stays on track for the 2030 Agenda.

UN support for achieving the 2030 Agenda that determines and reflects the UN system’s contributions, while also shaping the configuration of UN assets required to meet four strategic priority areas. The Priority area 3 sets the goal of Protecting the Environment and Addressing Climate Change. The program’s long-term goal is to increase the share of renewable energy in installed electricity capacity to 30 percent before 2030. In the medium term the goal is to ensure that all people, will have benefit by 2025 from climate strategies and environment protection policies by establishing sustainable management of natural resources and conservation of the biodiversity, restore ecosystems, and ensure that resilience is strengthened.

As earlier mentioned, continuing energy efficiency measures and development of renewable energy sources could further reduce GHG in the energy sector of Azerbaijan. Although that the primary legislation related to energy efficiency and renewable energy sources have been adopted, the secondary legislation including regulations and technical standards shall be developed and adopted, too. In this context, certain national targets on energy efficiency and renewable energy sources shall be set as well for better planning the envisaged activities in relevant fields. The draft First National Energy Efficiency Action Plan (NEEAP) 2021-2025 of the Republic of Azerbaijan was developed within the framework of EU4Energy program of European Union and the International Energy Charter was prepared in 2020. The document has the following horizontal and cross-cutting measures and their application in relevant sectors:

Table 3. Horizontal and cross-cutting measures and their application as per the sectors in NEEAP

No.	Title	Supply side	Buildings (residential and public)	Public/services	Industry	Transport	Agriculture
C1	Develop and adopt primary and secondary legislative acts on energy efficiency	X	X	X	X		
C2	Strengthen the administrative and institutional structure for energy efficiency	X	X	X	X	X	X
C3	Establish Energy Efficiency Fund		X	X	x		
C4	Develop and maintain energy efficiency monitoring and reporting system	X	X	X	X	X	X
C5	Implement awareness raising and training activities on energy efficiency	X	X	X	X	X	X
C6	Eco-design and labelling	x	x	x	x	x	x

In terms of combining the national energy sector targets with climate change mitigation objectives, the draft “EU-funded Support to the Government of Azerbaijan to Develop Energy Sector: Long Term Energy Strategy for Azerbaijan Project” report [14] completed in mid-2020 can be regarded as a good initiative in terms of mainstreaming climate change into national energy policy in Azerbaijan. The overarching objectives of this Long-Term Energy Strategy was interlinked with the broader national economy strategy:

- The foundations of the future developments should consider the present reality of low oil and gas prices for consumers.

- The opportunities of oil and gas exports increase should be supported by taking measures of more efficient and rational domestic energy use.
- Increase of energy services effectiveness passes through improvement of business environment and increase of competition and role of private sector economy.
- Compliance with United Nations climate change policy has been decided by the country and the energy sector constitutes the most significant area for GHG emission reduction measures.

The following three scenarios have been assessed in this Strategy:

- *Base Scenario* (BS) that incorporates a conservative approach for measures on energy efficiency, renewables, market restructuring; it has no GHG emissions target as it is placed with the UNFCCC initiative (Paris Agreement).
- *Climate Change Compliance Scenario* (CCCS) that incorporates an enhanced and faster implementation of actions, as compared to the Base Scenario. It sets GHG emissions targets to fulfil the carbon emissions obligation of Azerbaijan in 2030 and 2050.
- *Climate Change and High Development Scenario* (CCHD) that additionally incorporates in the CCCS scenario a faster growth of national economy. It has the same GHG emissions target but under a higher economic growth path of the country.

METHODOLOGY

Methodological frameworks and approaches in mainstreaming climate change into energy policy

Climate change is affecting the environment mainly through greenhouse gas emissions, largely caused by energy-related industries. International organizations and countries have been therefore making efforts to consider this problem in their policies by re-defining their policies and strategies towards ‘low-emission’ concept, thus, linking climate change with energy-related policies and strategies. This challenge requires cohesive activities incorporating societal, economic and technical aspects. Mainstreaming, or adapting, climate change issues into macro level sectors including energy sector have been therefore scholarly well studied and applied, particularly by various international organization in the context of assisting governments in adapting climate change. The outlines of these approaches and methodological frameworks applied by international organizations are the follows.

World Bank Group

The World Bank Group has prepared the Action Plan on Climate Change Adaption and Resilience for its operations [15]. The document specifies three core objectives for the Bank for climate change resilience for the period of up to 2025:

- Boost climate change adaptation financing
- Drive a mainstreamed, whole-of-government programmatic approach
- Develop a new rating system to create incentives for, and improve the tracking of, global progress on adaptation and resilience

Furthermore, the World Bank has launched an online tool in 2015 to help countries screen their policies for climate and disaster risks [16]. These tools provide a systematic and consistent way of considering short and long-term climate and disaster risks at an early-stage of project and national/sector planning processes. Screening is a first but essential step to make sure that these risks are assessed and managed in development planning. These open-source screening tools are universally applicable, and do not require one to be a climate expert. In fact, the tools are designed to help raise awareness of the challenges

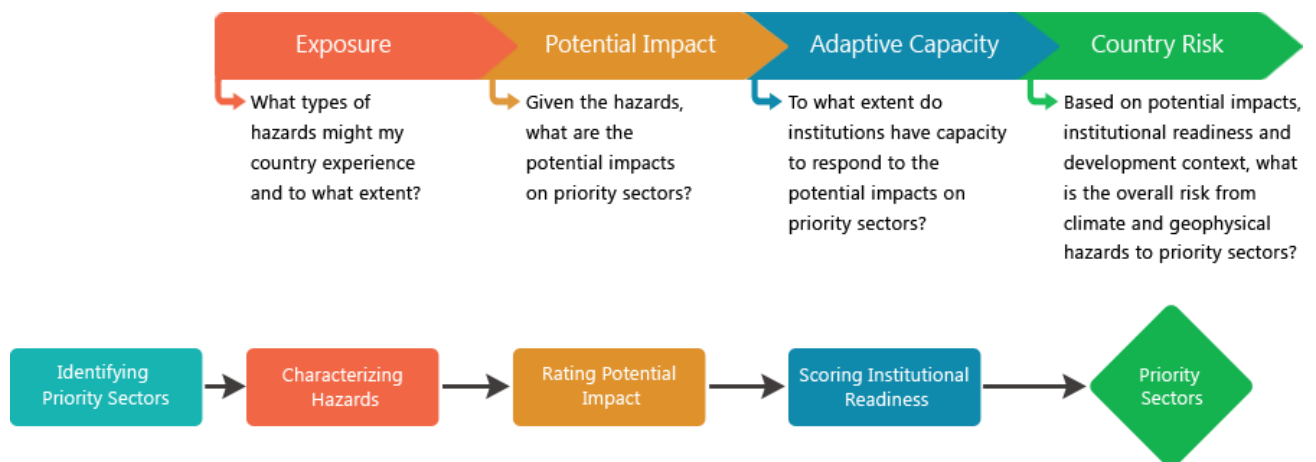
posed by climate change, while enhancing the ability of the user to think through these risks more routinely over time.

The national tool out of the tool package targets national planning processes, sector-wide strategies, development policy reforms and institutional strengthening at sector and national level. The project level tools target investments in key sectors including agriculture, water, roads, coastal flood protection, energy, and health. Additionally, there is a menu driven tool that targets investments for a range of other sectors, including natural resource management (forest, fisheries, biodiversity), education, financial management, urban, non-road transport, social and community development.

The screening process provide users with an overview of risks for key aspects of their project/program. These early screening results could inform consultations, dialogue, and form the basis for follow-up work including detailed technical assessments and feasibility studies.

The national/policy level tool is designed to walk users through a series of steps to understand the level of risk posed by climate and other natural hazards at an early stage of planning and design of national or sector-wide strategies, development policy, institutional strengthening and/or reforms. The tool does this by making data on climate change (historic, projected) available in an accessible manner. The tool helps the user connect this information to the broader development context at the sector level. The tool includes an Institutional Readiness Scorecard (IRS), which provides a rapid assessment framework to score current client institutional and adaptive capacity at the national/sector level.

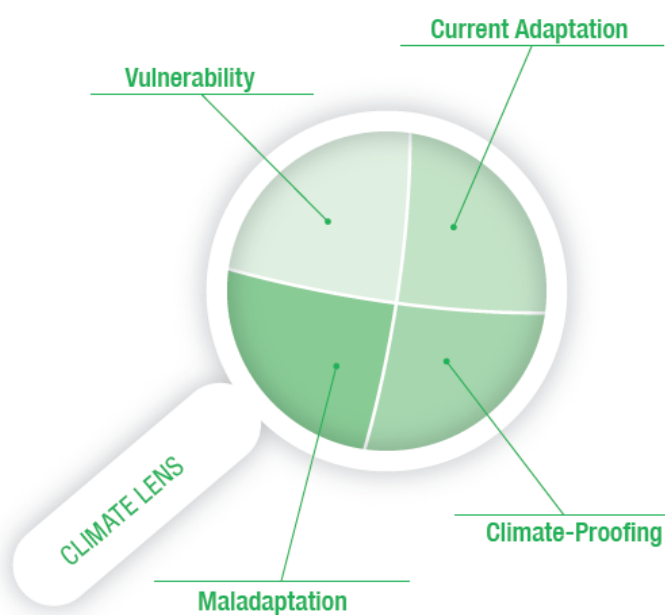
Figure 2. Consequence of screening activities in national/policy level tool [16]



Organization for Economic Cooperation and Development (OECD)

OECD’s methodological approach for climate change adaption in various levels is based on its Policy Guidance on Integrating Climate Change Adaptation into Development Cooperation [17]. This guidance is based on a whole-of-government approach to integration, addressing four levels of decision making: national, sectoral, local and project. The core step in OECD’s guidance is so-called “climate lens” tool. It is a simple analytical tool to reveal the climate risk and possible countermeasures. It is a set of four questions - vulnerability, current adaptation, maladaptation and climate-proofing. The use of climate lens should enable a policy maker to determine whether a policy, plan or programme is at risk from climate change.

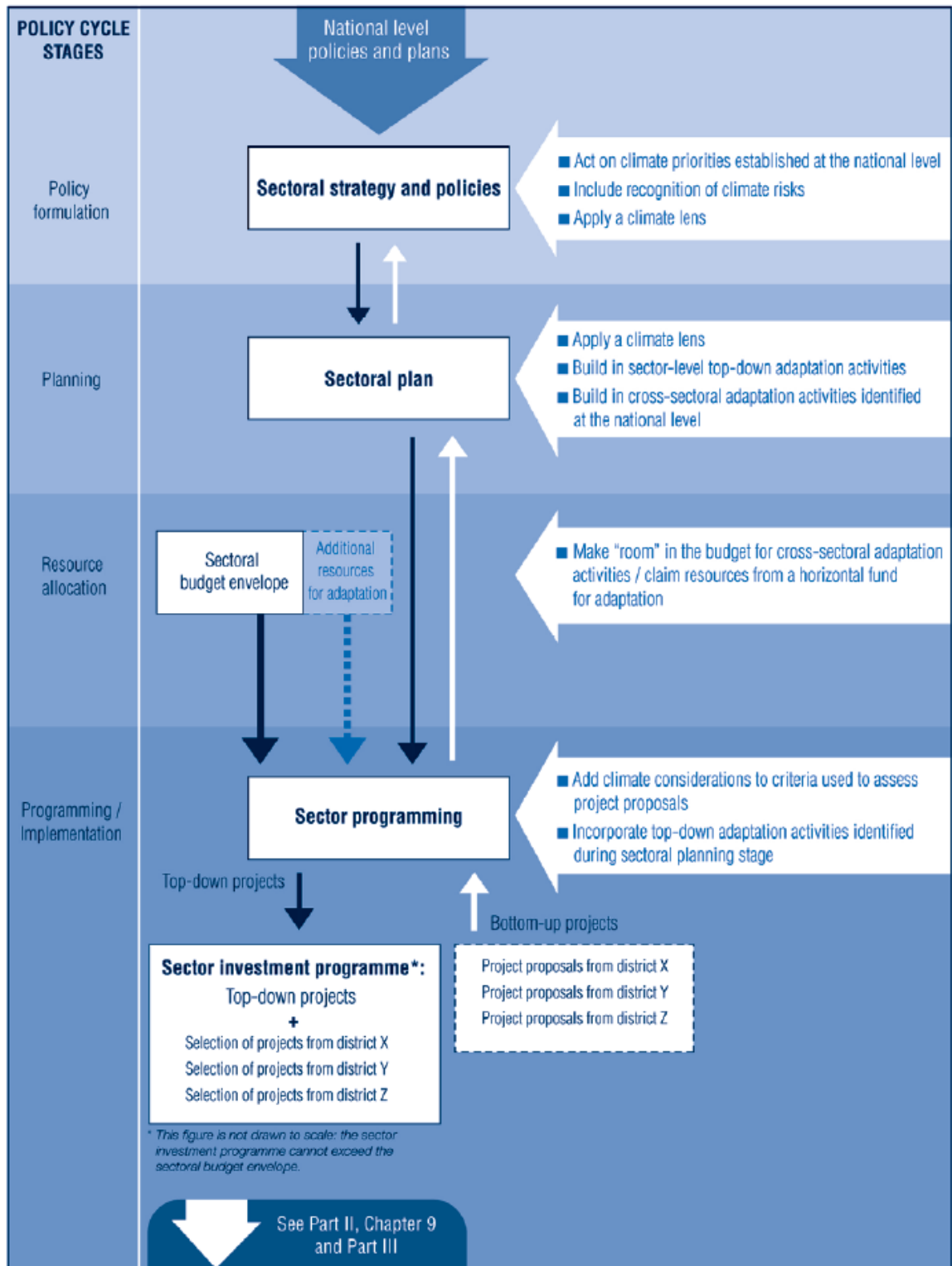
Figure 3. Application of climate lens [16]



<i>Using the climate lens</i>	
Q1: VULNERABILITY	How vulnerable is the decision to climate change?
Q2: CURRENT ADAPTATION	To what extent have climate change risks already been taken into account?
Q3 MALADAPTATION	Does the decision increase vulnerability to climate change or overlook opportunities for adaptation?
Q4: CLIMATE-PROOFING	Can the decision be amended to take into account the risks posed by climate change?

OECD’s Policy Guidance breaks down the sectoral level climate change adaptation process into four stages: (i) policy formulation, (ii) planning, (iii) resource allocation and (iv) programming. The following diagram depicts these consequent stages:

Figure 4. The stages of climate change adaptation process in sectoral level as per OECD Guidance [17]



European Union (EU)

EU has prioritized the climate resilience at the heart of its climate change adaptation agenda. “Forging A Climate-Resilient Union” is the new statement for the EU’s climate change process. The European Green Deal, the EU’s growth strategy for a sustainable future, is predicated on the realisation that the green transformation is an opportunity and that failure to act has a huge cost. The long-term vision is that in 2050, the EU will be a climate-resilient society, fully adapted to the unavoidable impacts of climate change.

As per the EU Commission, Climate mainstreaming and proofing represents a way to reduce the potential impacts of climate change through the anticipation and allocation of respective program expenditure and project design for planned adaptation and risk management. The requirements by EU for its member states in terms of adapting national energy policies to climate change are set in the Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013 [18].

United Nations Development Programme (UNDP)

UNDP’s overall methodological approach for climate change adaptation is described in its guidebook “Preparing Low-Emission Climate Resilient Development Strategies – UNDP Guidebook” [19]. The guidebook distinguishes the five steps for the development of low-emission climate resilient development strategies for countries as described in below figures:

Figure 5. The steps of preparing a Low-Emission Climate Resilient Development Strategy (LECRDS) [19]

STEP 1: Develop Partnership and Coordination Platform and Multi-Stakeholder Participatory Planning Process			
Objective	Who?	How? (activities)	What? (products)
To identify and establish a multi-sectoral, multi-level, multi-stakeholder governance framework making it possible to ensure stronger coordination between decision-making levels (international, national, local) and stakeholders in given region	Implementing agency Supported by elected officials responsible for project	1. Organize project coordination structure <ul style="list-style-type: none"> ■ Project Team Coordinator ■ Project Team composed of sectoral representatives 	?? Project coordination structure established
	Project team Supported by elected officials	2. Mobilize actors and stakeholders towards partnership and coordination platform <ul style="list-style-type: none"> ■ Map key climate issues, opportunities and stakeholders ■ Ensure high-level policy and political involvement ■ Involve different decision-making levels ■ Identify and mobilize key actors in each sector ■ Train elected officials, agencies, and key actors as necessary ■ Prepare communications and awareness raising strategy 	?? LECRDS process presented to different sectors and partners ?? Communication campaign launched
	Project team Supported by elected officials	3. Define multi-stakeholder participatory process at national/regional/municipal level <ul style="list-style-type: none"> ■ LECRDS steering committee <ul style="list-style-type: none"> □ Comprised of key elected officials and high-level civil servants with objective of policy creation and approval ■ Thematic policy and technical working groups <ul style="list-style-type: none"> □ Assess required and existing expertise □ Determine prospective composition of thematic working groups: finance; energy; agriculture; forest and natural resources; water; urban infrastructure; transport; gender; etc. □ Include local/regional/national authorities, sectoral agencies/ministries, private sector, academia, research institutes, NGOs, community organizations, etc. 	?? Process of multi-stakeholder participation involving a given region’s decision-makers, actors, and stakeholders defined
	LECRDS steering committee Supported by project team	4. Establish LECRDS multi-stakeholder, multi-sectoral, multi-level process <ul style="list-style-type: none"> ■ Define objectives and scope ■ Define operational and organizational structure, roles and responsibilities, and budget ■ Define steps, methods, and timetable ■ Presentation of multi-stakeholder process to all stakeholders, partners, actors in region 	?? Partnership and coordination platform and multi-stakeholder process validated

STEP 2: Prepare Climate Change Profiles and Vulnerability Scenarios

Objective	Who?	How? (activities)	What? (products)
To assess GHG emissions and identify points of vulnerability within given region over medium to long term, based on a reference scenario involving a business as usual and alternative development trajectories	National climate experts (national communications team, research institutes, learned societies, etc.)	1. Develop climate scenarios (2050/2075/2100) <ul style="list-style-type: none"> Collect existing climate data and acquire the missing data Define objectives, scope of exercise, and choice of downscaling methodology Produce two sets of climate scenarios based on scenarios for high and low emissions 	<ul style="list-style-type: none"> Exercise in climate forecasting making it possible to describe range of possible future climate change
	Supported by project team and consultants	2. Establish BAU scenarios for GHG emissions <ul style="list-style-type: none"> Define objectives, scope of exercise, and choice of methodological approach Quantify and assess current emissions (by sector/usage; by GHG or energy) Projected scenarios for future emissions based on existing business as usual development scenario 	<ul style="list-style-type: none"> Current emissions diagnosis Projected scenarios for future emissions
	Thematic working groups Supported by project team	3. Assessment of current and future vulnerabilities <ul style="list-style-type: none"> Study of current vulnerability (observed climate variability) and points of vulnerability On the basis of the climate scenarios and business as usual development scenario, assessment of future vulnerabilities 	<ul style="list-style-type: none"> Study of current vulnerability Assessment and future vulnerability map

STEP 3: Identify Strategic Options Leading to Low-Emission Climate-Resilient Development Trajectories

Objective	Who?	How? (activities)	What? (products)
To collectively identify options for transforming the development trajectory	LECRDS steering committee Supported by project team	1. Presentation of results of region's climate analysis <ul style="list-style-type: none"> LECRDS steering committee reviews findings and analysis 	<ul style="list-style-type: none"> Climate scenarios and vulnerability mapping shared and appropriated by national/regional/municipal actors and stakeholders
	Thematic working groups Supported by project team	2. Develop sectoral scenarios for low-emission development that are more climate change resilient <ul style="list-style-type: none"> Identify several energy development scenarios Develop different models for socio-economic development and management that are more climate change resilient Assess their impact on region's vulnerability 	<ul style="list-style-type: none"> Different sectoral scenarios with low GHG emissions Studies of impact of different sectoral development scenarios on region's vulnerability
	LECRDS steering committee Supported by thematic working groups and project team	3. Determine common strategy for low-emission development that is more climate change resilient <ul style="list-style-type: none"> Identify various mitigation and adaptation options Identify priority action areas that could redefine development trajectory Build consensus regarding priorities Recommend sectoral and cross-sectoral development strategies Consolidate and synthesize deliberations and decisions 	<ul style="list-style-type: none"> A common strategy for low-emission and climate change resilient development Synthetic analysis bringing together all paths of action considered and recommended

STEP 4: Identify Policies and Financing Options to Implement Priority Climate Change Actions			
Objective	Who?	How? (activities)	What? (products)
To prioritize options based on technical, social, and financial feasibility over short, medium, and long term	Project team	1. Organise technical, social, and financial feasibility and cost-benefit analysis <ul style="list-style-type: none"> ■ Analyse recommendations of synthetic report ■ Consultations with sectoral agencies/ministries 	?? Work plan for prioritizing options
	Thematic working groups	2. Prioritize adaptation and mitigation options <ul style="list-style-type: none"> ■ Analyse barriers for each option (political, gender, and social feasibility, cost-benefit, capital required, etc.) ■ Definition of prioritization criteria 	?? List of priority actions for adaptation and mitigation
	LECRDS steering committee Supported by thematic working groups and project team	3. Assessment by sector of public policies and investments required for implementing options <ul style="list-style-type: none"> ■ Identification of public policy instruments and investments required and selection of optimal combination ■ Selection of the most appropriate financing mechanisms ■ Short-/medium-/long-term recommendations 	?? Technical mandates by sector, accompanied by implementation and financing recommendations

STEP 5: Prepare Low-Emission Climate-Resilient Development Roadmap			
Objective	Who?	How? (activities)	What? (products)
To establish an integrated roadmap bringing together short-, medium-, and long-term actions and implementation strategies	Project team and LECRDS steering committee Supported by thematic working groups	1. Formulating LECRDS roadmap <ul style="list-style-type: none"> ■ Consolidate contributions of all sectors <ul style="list-style-type: none"> □ Reviews and consolidation of sectoral work in order to define an integrated roadmap ■ Definition of the different components of roadmap <ul style="list-style-type: none"> □ Short-/medium-/and long-term priorities and associated public policies □ Investments required and Financing Plan — sectoral pathways □ Institutional and operational framework for implementation ■ Definition of monitoring and evaluation mechanisms <ul style="list-style-type: none"> □ Monitoring indicators □ MRV 	■ LECRDS Roadmap
	Project team and LECRDS steering committee Supported by thematic working groups	2. Preparing for policy decisions and implementation <ul style="list-style-type: none"> ■ Plan submitted to Parliament (national, regional, or municipal) for approval ■ Approval for setting up public-private partnerships ■ Presentation of LECRDS roadmap to stakeholders ■ Preparation with private sector and civil society of first generation public policy and investment projects ■ Distribution of LECRDS Roadmap to key public and private financial actors (international/regional/national) 	■ Vote by Parliament

US Agency for International Development (USAID)

USAID has been actively involved in climate change mitigation and adaptation process in national and community level in many countries. Its methodological approach for climate change mainstreaming is described in its framework for understanding and addressing the risks of climate change for development [20]. The key actions envisaged by the framework is illustrated in below figure:

Figure 7. USAID’s Climate Resilient Development Framework [20]



Establishes development context and focus

Identifies:

- Priority development goals and key inputs to achieving them
- Climate and non-climate stressors
- Needs and opportunities



Enhances understanding about vulnerability

- Defines vulnerability assessment questions
- Selects methods
- Assesses vulnerability
- Provides actionable information



Identifies, evaluates, and selects adaptation options

- Identifies adaptation options
- Selects evaluation criteria
- Evaluates adaptation options
- Selects an adaptation option or portfolio of options



Puts adaptation into practice

- Builds on established implementation and management practices
- Adopts a flexible approach to account for continuing change
- Incorporates climate information into baseline values and indicators



Tracks performance and impact

- Builds on established evaluation practices
- Measures performance
- Evaluates impacts of actions on vulnerability
- Informs adjustments to adaptation strategies

RESULTS AND DISCUSSION

The methodological approaches and tools used by various organizations seem somewhat similar in overarching context and application. Based on the methodological tools analyzed in previous sections, the general aspects of mainstreaming climate change issues into countries' energy policy can be summarized as below:

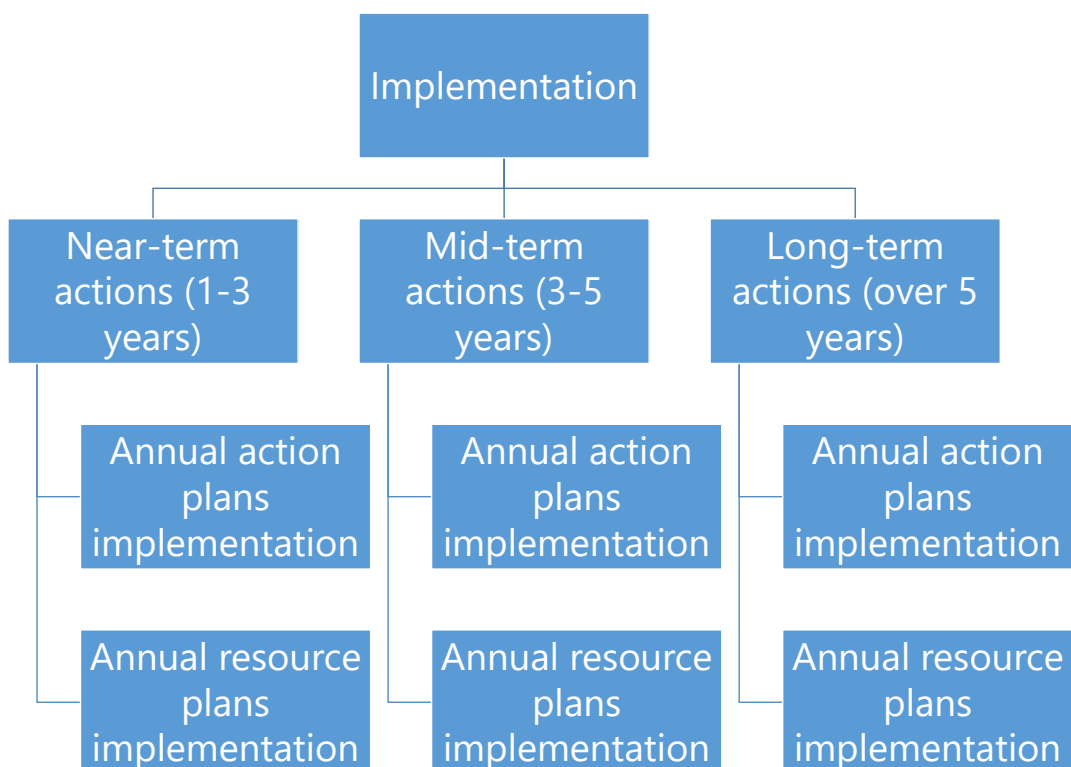
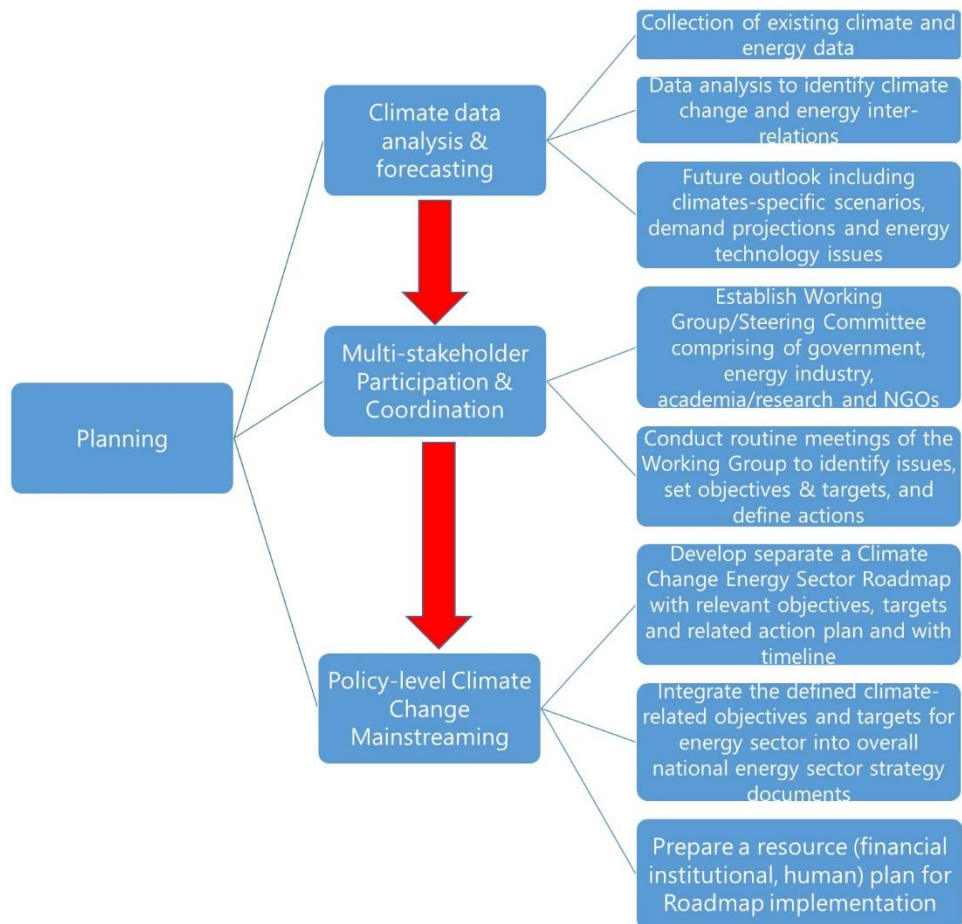
- Information and awareness on potential impacts of climate change – It is important to obtain the most recent, comprehensive and relevant data on potential implications of climate change with regard to energy sector. Climate-specific data shall be periodically and systemically collected for cohesive 'climate-energy nexus' analysis.
- Multilateral stakeholder involvement and coordination – Climate change adaption efforts are not just responsibilities and concerns of governments. As the climate change affects countries

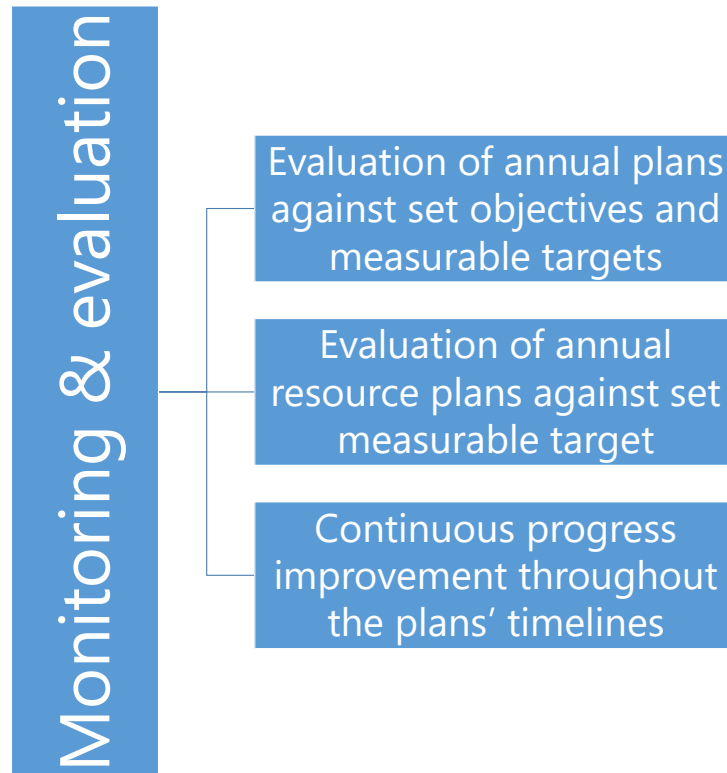
in economic, political and societal context, decision-making process on climate change adaptation should be implemented with the engagement of all stakeholders, i.e. energy policy-makers, energy companies, energy-related non-governmental organizations, and research/academia circles. Besides the multilateral stakeholder involvement and coordination, the intra-government coordination and involvement with strong government leadership is also pivotal in climate adaptation processes. Governments should engage all its related agencies, both horizontally and vertically integrated organizations.

- Near-term, mid-term and long-term climate change adaptation planning as part of countries' national policies – Since the climate change affects all, the adaptation actions should not be regarded as separate 'environment' activities, but as an integral part of national development policies and strategies. The adaptation planning for all timeframes (i.e. near-term, mid-term and long-term) should have measurable targets, and include the clauses on resource (financial, institutional and human) requirements.
- Monitoring, evaluation and improvement of climate adaptation plans for energy sectors – As with any kind of planning, the progress of climate adaptation//mainstreaming plans for energy sector should be periodically monitored, and the implementation results be evaluated against set measurable targets. Based on monitoring and evaluation results, relevant correction actions should be undertaken for improvement.

The author proposes the following potential methodological approach and tools for mainstreaming climate change issues into Azerbaijan's energy policy based on the reviewed information in previous sections, described in next paragraphs. Three main pillars can be distinguished in mainstreaming process – (i) planning; (ii) implementation; and (iii) monitoring & evaluation

Figure 8. Proposed methodological approach for mainstreaming climate change issues into Azerbaijan's energy policy





CONCLUSION

The proposed methodological approach can be used by respective government agencies, such as the Ministries of Energy and Environment and Natural Resources. It should be noted that Azerbaijan has already made efforts on mainstreaming climate change issues into its energy policy. The Socio-Economic Development Strategies of the Republic of Azerbaijan for 2022-2026 adopted in 2022 [21] and the draft Long-term Energy Strategy for Azerbaijan for 2050, discussed above, could serve as foundations for more formal policy and strategy-level climate change mainstreaming. While the National Priorities document emphasizes the need for climate change adaptation (i.e. 'high quality ecological environment', 'green energy zone') in strategic and policy context, the Long-term Energy Strategy tried to formulate climate-oriented roadmap for energy sector evolution with related scenarios. The author therefore believes that the Government of Azerbaijan could further elaborate the Long-term Strategy using the methodological approach proposed above, with due consideration of National Priorities and the outlook documents on climate change prepared by international organizations.

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