Annex

to decree N --- -L of the Government of the Republic of Armenia of

---- 2023

LONG-TERM (UNTIL 2050)
LOW EMISSIONS DEVELOPMENT STRATEGY
OF THE REPUBLIC OF ARMENIA

CONTENTS

ACRONYMS

IPPU	Industrial processes and product use
TPES	Total primary energy supply
WOM	Without Measures scenario
NDC	Nationally determined contributions
ECA	Export credit agency
AIS	Automated information system
DFI	Development finance institution
LT-LEDS	Long-term low emissions development strategy
TFC	Total fixed cost
WAM	With Additional Measures scenario
WM	With Measures scenario
CC	Climate change
KPI	Key performance indicators
ACC	Adaptation to climate change
IPCC	Intergovernmental Panel on Climate Change
CCMRV	Climate change monitoring, reporting and verification platform
GCF	Green Climate Fund
ANPP	Armenian Nuclear Power Plant
HPP	Hydropower plant
ENA	Electric Networks of Armenia CJSC
PSRC	Public services regulatory commission
RA	Republic of Armenia
GDP	Gross domestic product
UNFPA	United Nations Population Fund
UNDP	United Nations Development Programme
UN	United Nations
UNFCCC	UN Framework Convention on Climate Change
IFC	International Finance Corporation
GHG	Greenhouse gas
LLC	Limited liability company
EBRD	European Bank for Reconstruction and Development
SC	Statistics Committee
ICT	Information and communication technologies
CJSC	Closed join-stock company
PV	Photovoltaic
BUR3	Third biennial update report of Armenia
ISO	International Organization for Standardization
KfW	German Development Bank (KfW)

ABBREVIATIONS

eq.	Equivalent
mln	Million
bln	Billion
toe	ton of oil equivalent

MEASUREMENT UNITS

g	Gram
Gg	gigagram (10^9 g or thousand t)
t	tonne
m	meter
m^3	cubic meter
mm	millimetre
cm	centimetre
km	kilometre
km^2	square kilometre
km^3	cubic kilometre
ham	hectare
GJ	gigajoules (10^9 J)
TJ	terajoules (10^{12} J)
kWh	kilowatt hours (10^3 Wh)
MW	megawatt (106 W)
GWh	gigawatt hours (109 Wh)
m/s	meter per second
^0C	degree Celsius

CHEMICAL COMPOUNDS

CO_2	carbon dioxide
CH_4	methane
N_2O	nitrous oxide
HFCs	hydrofluorocarbons
PFCs	perfluorocarbons
SF_6	sulfur hexafluoride
CO	carbon monoxide
NMVOC	non-methane volatile organic compounds
NO_x	nitric oxide
SO_2	sulfur dioxide

Energy units conversion

1 toe = 41.868 GJ = 11.63 MWh
1 GWh = 3.6 TJ = 86 toe

1. INTRODUCTION

Today climate change is a global problem of mankind. Since the 1970s the world has been experiencing a global change in climate conditions, it manifests itself in an increase in temperature and decrease in precipitation. As a result of anthropogenic activity, there was a significant increase in natural greenhouse effect leading to additional warming of the Earth's surface and atmosphere. Climate change currently observed and expected in the future is associated with widespread and irreversible consequences for anthropogenic and natural systems, and carries risks to ensure economic, energy, food security and sustainable development. To minimize these risks, it is necessary to adapt the systems of administration, economy sectors and infrastructure to changing climate conditions.

Climate change has a significant impact on Armenia, namely, the number of natural disasters increases and natural cycles change (an increase in the number of droughts, early frosts, forest fires and floods), biodiversity is being decreased. During the period of 1990-2019 deviation of the average annual temperature from the baseline period (1961-1991) was on average 1.23°C. In 2019, a deviation of 1.5°C from annual average temperature for the period of 1961-1990 was recorded. Therefore, despite the insignificant share of Armenia in anthropogenic greenhouse gas emissions of 0.02%, the country has actively joined the global processes to combat climate change.

Armenia ratified the UN Framework Convention on Climate Change (UNFCCC) in May 1993, the Kyoto Protocol in December 2002 and its Doha Amendment and Paris Agreement in February 2017. The Paris Agreement is the first legally binding global climate change agreement, which sets out a plan for avoiding dangerous climate change aiming to limit global warming to well below 2°C compared to pre-industrial levels, preferably to 1.5°C.

Article 4 of the Paris Agreement states that all parties should strive to formulate and communicate long-term low greenhouse gas emission development strategies (LT-LEDS), considering their common but differentiated responsibilities and respective capabilities. LT-LEDS guides countries on the path to achieving this goal while ensuring that high, sustainable, balanced and equitable growth is harmonized with climate plans. LT-LEDS supports solving a wide range of issues, such as alignment of ambitious development goals and climate measures, provision of a long-term agenda for short- and medium-term commitments, delivery of early and predictable messages to high-emitting sectors and economic entities, consideration of mitigation opportunities across the economy, development of economic policy in line with the trends of technological progress in the context of transforming challenges into opportunities.

The program of the RA Government addresses the issue of increasing the country's resilience to climate change by contributing to implementation of the best adaptation practices, active participation in global efforts towards low-carbon development, and proper fulfilment of international commitments on climate change mitigation.

Pursuing these goals and adhering to its international commitments in the fight against climate change, the RA Government implements Long-Term (until 2050) Low Emissions Development Strategy of the Republic of Armenia.

2. MIAN FACTORS INFLUENCING GREENHOUSE GAS EMISSIONS

1. Carbon dioxide (CO_2) dominated in greenhouse gas national inventory report of Armenia for 2017[1], with a share of about 53% of the total emissions, followed by methane (CH_4) – of about 30.6%, nitrous oxide (N_2O) accounted for 9.9% of the total emissions in 2017 and hydrofluorocarbons (HFCs) – for roughly 6.5%. The share of sulfur hexafluoride (SF_6) is negligible.

2. The energy sector (including transport) is responsible for over 95% of all carbon dioxide emissions, because of high emissions volume from thermal power plants, road transportation and residential sector. Carbon dioxide emissions from cement production of IPPU sector made about 4.7% of total carbon dioxide emissions. Carbon dioxide emissions from the waste sector are negligible.

3. Methane emissions are mostly from the energy sector (about 52%) due to fugitive emissions from natural gas system. The second largest source of methane emissions is the agriculture sector with its share of 31% mainly due to the emissions from cattle enteric fermentation. The waste sector is the third (nearly 17%).

4. Most of nitrous oxide emissions (about 90%) are from the agriculture sector mainly due to nitrogen fertilizer management and direct and indirect emissions from managed soils.

5. Emissions of HFCs (from the use of refrigerators, air conditioners and other appliances) and sulfur hexafluoride (from the use of electrical equipment) account for 6.5% of the total GHG emissions, however their share is continuously increasing.

Energy sector

6. The energy sector is by far the largest producer of GHG emissions. In 2017, the energy sector accounted for 66.7% of Armenia's total GHG emissions. The energy sector includes emissions from use of fuels to generate energy including fuel used in transport and fugitive emissions related to transmission, storage and distribution of natural gas. The majority of the sector's emissions (77%) results from fossil fuel combustion.

7. In 2020, Armenia produced 0.67 million toe electricity, of which 35.2% came from nuclear power plant, 40.7% – from thermal power plants, 22.7% – from hydro power plants, and 1.7% – from wind and solar plants. Since 1990, Armenia gradually and completely phased out mazut from the electricity mix. Total consumption of energy was 2.55 million toe. Households are the largest consumers of final energy (33.62%). Transport is the second largest final energy consuming sector (33.54%).

8. In 2017 the energy sector emissions decreased by 3.2 times compared to the year 1990, while Total Primary Energy Supply (TPES) decreased by 2.4 times, which is an evidence of low-carbon development trends in Armenia. Key factors for such trends are the structural changes in economy towards the increased share of services sector and decreased share of energy intensive industries, replacement of mazut with natural gas in energy production, significant increase in the use of natural gas in the transport sector, which replaced diesel and gasoline, recommissioning of Armenian Nuclear Power Plant, increasing share of renewable sources (strongest growth of the small hydropower plants), and energy efficiency actions.

9. Most of Armenia's buildings are residential dwellings, whereby 52% are individual houses and 45% are multi-apartment buildings.

[1] The latest available data were used, based on Greenhouse Gases National Inventory Report of the Republic of Armenia for 1990-2017 and 2020 Energy Balance of the Republic of Armenia.

10. In 2015 UN and PACE estimated that 6% of Armenia's multi-apartment buildings is in "good" condition; 64% is "fair"; and 30% is "poor". Around 75% of multi-apartment buildings were in 1951-1990, and they do not meet the requirements of thermal protection system.

11. Natural gas consumption (60.3%) is dominant in the energy consumption structure of households, while natural gas and electricity together cover 78.5% of energy consumption. Overall, gas consumption for heating accounts for about 50% of energy consumption. The share of renewables in energy resources remains low. In 2019, solar energy consumption in the household sector amounted to 4.3 ktoe or 0.5% of the total energy consumption.

12. **Road transport** generated 24.8% of the energy sector emissions in 2017. Other significant emission source in the energy sector was fugitive emissions of natural gas, share of which in 2017 was slightly less – 23.0%.

13. Armenia is landlocked and at the same time has serious transport constraints that affect economic competitiveness due to high transport costs and expensive infrastructure development and maintenance. International comparisons show that at current level of economic development the transport sector in Armenia is energy-intensive, therefore its energy efficiency is low.

14. In terms of decarbonization of the economy the most crucial role plays the fact that more than 60% of vehicles in Armenia already use natural gas as a fuel. In this regard, the structure of the vehicle fleet and the state of public transport are factors characteristic to Armenia.

15. 85% of vehicles in the RA are passenger cars. According to the data of the 1st half of 2022 the share of electric vehicles in the structure of the vehicle fleet is less than 3%; there are more than 100 charging stations for electric vehicles.

16. Renovation and popularization of public transport, promotion of electric vehicles use combined with introduction and development of suitable infrastructure and financial incentives are pivotal in terms of decarbonization of the transport sector.

Agriculture, Forestry and Other Land Use

17. The second largest source of GHG emissions was the agriculture sector with a share of 18.5%. Emissions from the agriculture sector include methane emissions from enteric fermentation of domestic livestock, manure management and biomass burning, nitrous oxide emissions from manure management, biomass burning and from managed soils, as well as CO_2 emissions from urea application.

18. Of the total agricultural emissions, CH_4 emissions from enteric fermentation accounted for 49.5% and from manure management 1.8%, while nitrous oxide emissions from manure management accounted for 4.8% and from soils management – 43.4%. The prevailing part (87%) of methane emissions from enteric fermentation are generated by cattle while the prevailing part of nitrous oxide emissions of about 90%, are from soils.

19. Forestry and other land use category acted as a carbon dioxide sink: the net removals were 470.6 Gg CO_2eq. Armenia's largest carbon sinks are the forests.

20. Irregular cuttings and the lack of forest protection measures resulted in the change of climatic conditions in the forests, as well as the increase of fire risk (high temperature, abundant light, branches and leaves due to cuttings). The largest emissions come from other land (29.63 Gg CO_2) as well as from grassland and wetlands categories (about 18 Gg CO_2 from each category).

Industrial Processes and Product Use

21. Emissions from this sector include non-energy related carbon dioxide emissions from mineral industry – cement, lime and glass production, carbon dioxide emissions generated from lubricant and paraffin use, HFCs emissions from use of refrigerators, air conditioners and other appliances, as well as sulfur hexafluoride emissions from use of electrical equipment. Emissions from the sector include also

sulfur dioxide emissions from metal industry, non-methane volatile organic compounds emissions from solvent use, asphalt production, as well as food and beverage industry.

22. The most significant carbon dioxide emissions' source is cement production (224.55 Gg CO_2), which accounts for 23.6% of the emissions from the sector and 2.1% of Armenia's total emissions. In cement production, approximately 62% of CO_2 originates in the calcining process and the remaining 38% is related to fuel combustion. The CO_2 emissions resulting from the combustion of the carbon content of the fuel are directly proportional to the specific heat demand.

23. Emissions from the use of HFCs, substitutes for ozone depleting substances in in refrigeration and air conditioning systems made 685.3 Gg CO_2eq., while SF_6 emissions from the use of electrical equipment were negligible – only 2.6 Gg CO_2eq.

Waste sector

24. CH_4 emissions from landfills, CO_2, CH_4 and N_2O emissions from the combustion of waste and CH_4 and N_2O emissions from wastewater treatment are reported under the waste sector. The waste sector emissions amounted to 620.7 Gg CO_2-eq. in 2017, which accounts for approximately 5.84% of the total emissions. Landfill emissions accounted for 68.7% of the total waste sector emissions, while emissions from the combustion of waste are insignificant and accounted for 3.33%. The emissions from wastewater treatment accounted for 28% of the total waste sector emissions in 2017.

25. Landfill emissions, being the major category of emissions, are the result of significant underdevelopment of waste management system, where best available technologies and practices are not yet introduced. Realization of certain national and regional solid and municipal waste management programmes in coming years combined with additional climate-specific measures should be the key to reducing the waste sector emissions.

3. LT-LEDS SCENARIO MODELLING

26. Three main scenarios are considered under LT-LEDS, within the scope of which Armenia will achieve its low-carbon development goals.

27. The **Without Measures (WOM)** scenario does not involve taking any measures and actions to reduce GHG emissions. This scenario assumes growth in all sectors: energy, industrial processes, agriculture, forestry and other land use, waste.

28. The **With Measures (WM)** scenario includes ongoing and planned measures to reduce GHG emissions for all considered sectors. Forests absorb and preserve carbon dioxide from the atmosphere. Reduction of GHG emissions will only be in the forestry sector due to increase in forest area and growth of carbon sink potential.

29. The **With Additional Measures (WAM)** scenario is ambitious and, if implemented, makes it possible to achieve the 2030 and 2050 targets.

30. Each scenario is comprehensively represented by GHG emissions in five sectors: energy, industrial processes and product use, agriculture, forestry and other land use and waste.

31. Scenario modelling is based on the assumptions that in the long-term GDP of Armenia will grow by an average of 4% per annum, and the population will reach 5 million by 2050.

32. Reductions expected from implementation of GHG emission reduction measures were subtracted from the total GHG emissions by sector.

4. LT-LEDS TARGET AND ITS LINKAGE WITH NDC TARGET

33. By Intended nationally determined contributions 2015 (INDC), the RA Government has set a long-term target for GHG emissions reduction until 2050, declaring the intention to achieve ecosystem climate neutrality. In 2021 the implementation period by the revised 2021-2030 NDC was fixed 2030 and short-term mitigation target to 40% below 1990 levels was set, at the same time ensuring that the long-term target set by the INDC is maintained.

34. **For the long term, the RA Government has set a target to reduce GHG emissions to 2.07 t CO_2eq/capita by 2050**.

35. Given that the timeline of the most part of the RA strategic documents is until 2030 or 2040, LT-LEDS provides not only a long-term decarbonization vision, but also sectoral actions and measures envisaged by key policy until 2050.

36. The NDC goal for 2030 is not to exceed the GHG emission rate of 15,513 Gg CO_2eq. If the WOM and WM scenarios are implemented, it will not be possible to achieve the 2030 target and it will be necessary to reduce another 3,801 Gg CO_2eq. and 555 Gg CO_2eq. With the implementation of the WAM scenario the set target of 2030 will be achieved (see Figure 1).

37. When implementing the WOM and WM scenarios, it is impossible to achieve the 2050 target, it is necessary to reduce GHG emissions by 5.91 and 1.4 Gg CO_2eq./capita respectively. However, with the implementation of the WAM scenario, the target is achievable already from 2040 (see Figure 2).

38. Sectoral scenarios until 2050 formed based on predicted values are presented in Table 1.

Figure 1. Gross GHG emissions under the WOM, WM and WAM scenarios by 2050

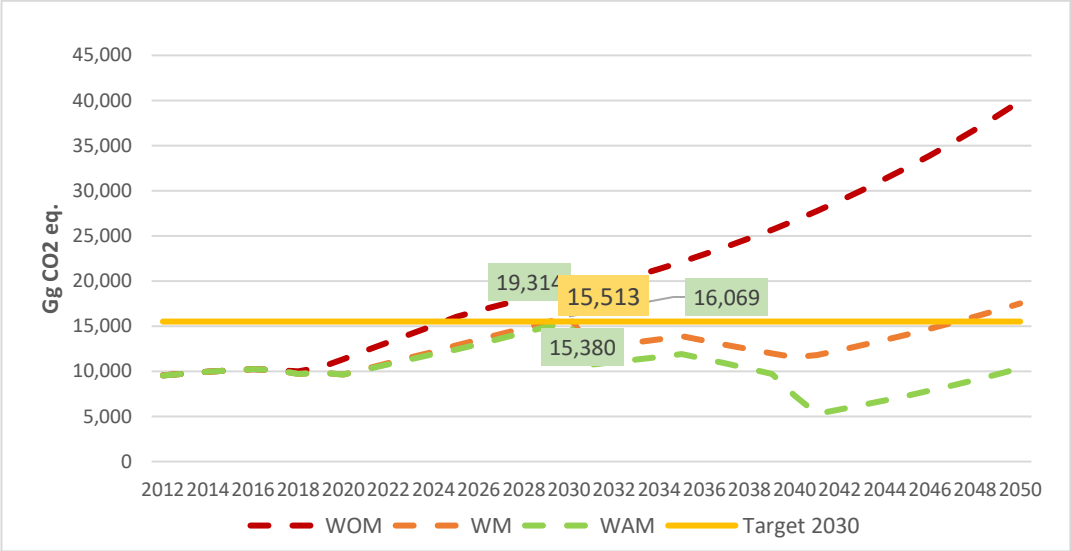


Figure 2. GHG emissions intensity under the WOM, WM and WAM scenarios by 2050

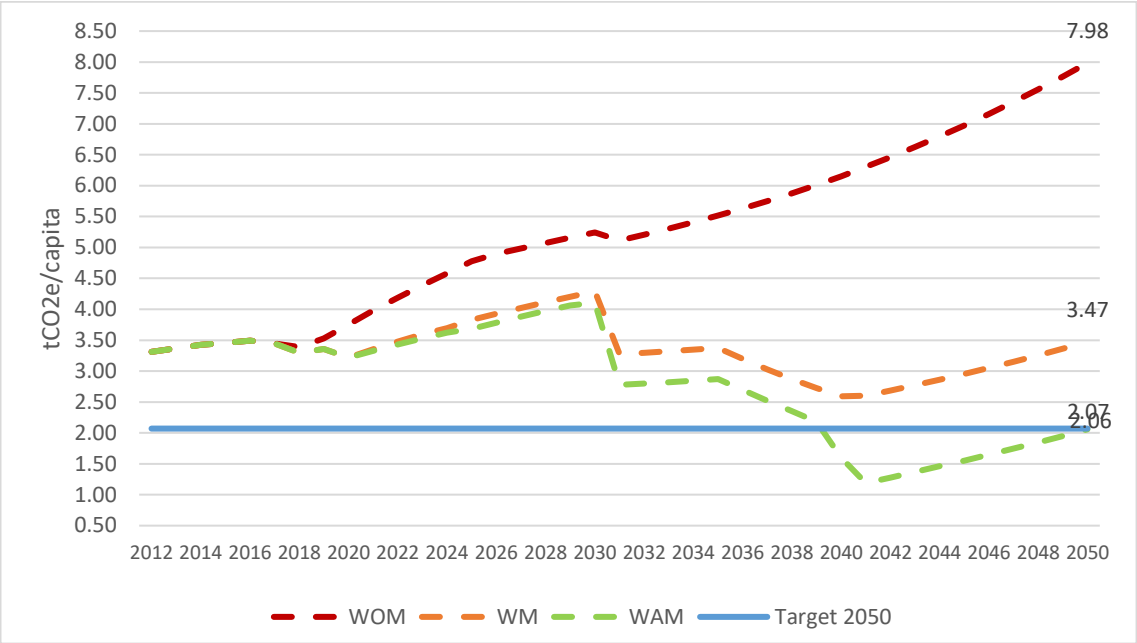


Table 1. GHS emission calculated by sectors and years, Gg CO_2eq

Sector/Year	2030			2040			2050		
Scenario	WOM	WM	WAM	WOM	WM	WAM	WOM	WM	WAM
Energy:	8,892	6,626	6,177	13,729	3,614	826	21,575	7,242	4,062
Transport	2,852	2,784	2,784	3,363	2,436	2,226	4,819	3,678	2,355
Buildings	2,681	2,617	2,617	3,161	2,441	2,180	4,529	3,417	1,938
IPPU	2,140	1,785	1,744	3,153	1,886	1,533	4,653	2,093	1,791
Agriculture	2,671	2,228	2,046	3,256	1,977	1,401	4,123	2,078	1,299
Waste	809	675	660	970	326	274	1,207	521	430
Forestry	-732	-648	-648	-930	-1,125	-1,125	-984	-1,510	-1,510

5. LOW-EMISSIONS DEVELOPMENT SCENARIOS

39. The above-mentioned three main scenarios of low-emission development of Armenia are built based on the below set of sectoral developments.

40. Reductions in GHG emissions in the **energy sector** is to be achieved by the introduction of new renewable and nuclear energy capacities.

41. For the WM scenario a targeted solar power capacity by 2050 is 700 MW. Named capacities are to be commissioned until 2030 and maintained over the following 20 years accounting for the total of 13,367 Gg CO_2eq. in GHG emissions reduction.

42. The WAM scenario assumes achieving 1000 MW in SPVs by 2030 maintaining it for 10 years and starting commissioning additional 50 MW yearly from 2040. The expected installed capacity of solar panels in 2050 should be 1,550 MW. Total GHG emissions reduction over 20 years should be 22,248 Gg CO_2eq.

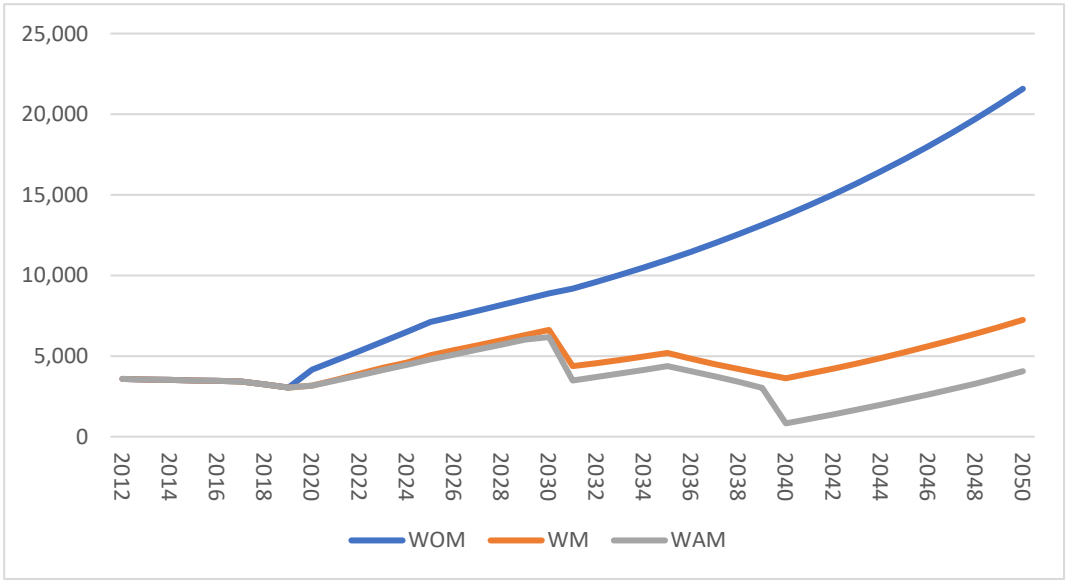
43. Additionally, WAM scenario requires introduction of wind- and hydropower capacities from 2040. Wind power capacities grow annually up to 610 MW, accounting for the total of 8,348 Gg CO_2eq. GHG emissions reduction in 2050. Hydropower plants should reach 430 MW of installed capacity by 2050, which would allow to reduce 11,129 Gg CO_2eq. of emissions.

44. Another assumption was introduced into the model, that is fugitive emissions – leakages from storage and transportation of natural gas would also be reduced, since the share of natural gas in the country's energy mix will be lowered due reduction in its consumption and introduction of renewable energy sources.

45. Thus, the WM scenario implies 67.54% reduction of fugitive emissions in 2050 providing 45,312 Gg CO_2eq. total GHG emissions reduction. The WAM scenario offers slightly lower reduction of 66.87% and 43,583 Gg CO_2eq. decline in GHG emissions.

46. For both WM and WAM scenarios the role of nuclear power is crucial. It is planned to complete the construction of the nuclear power plant by 2036 and start its operation. Nuclear power plant capacity in 2036 will be 212 MW, and by 2050 it will reach 1,060 MW, which will reduce 3,675 Gg CO_2eq. in 2050, or in total for 15 years 48,946 Gg CO_2eq. (see Figure 3).

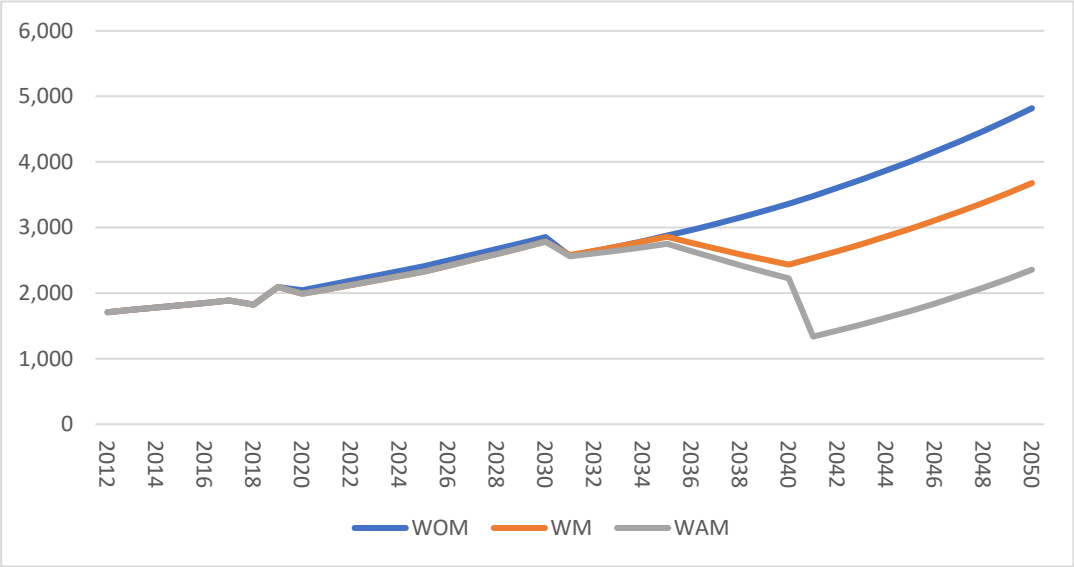
Figure 3. Energy sector (GHG emissions, Gg CO_2eq.)



47. In the **transport subsector** the increase in number of electric cars is of key importance. According to the WM scenario 100,000 new electric cars are expected to come to Armenia until 2030. By 2050 it is planned to gradually double the number of electric cars to 200,000, which will reduce annual emissions by 420 Gg CO_2eq. in 2050. In addition, the possibility of expanding the introduction a hybrid format of work will be promoted, which provides a 10% reduction in the number of fuel powered cars, leading to 3,099 Gg CO_2eq. total GHG emissions reduction over a period of 10 years from 2041 to 2050.

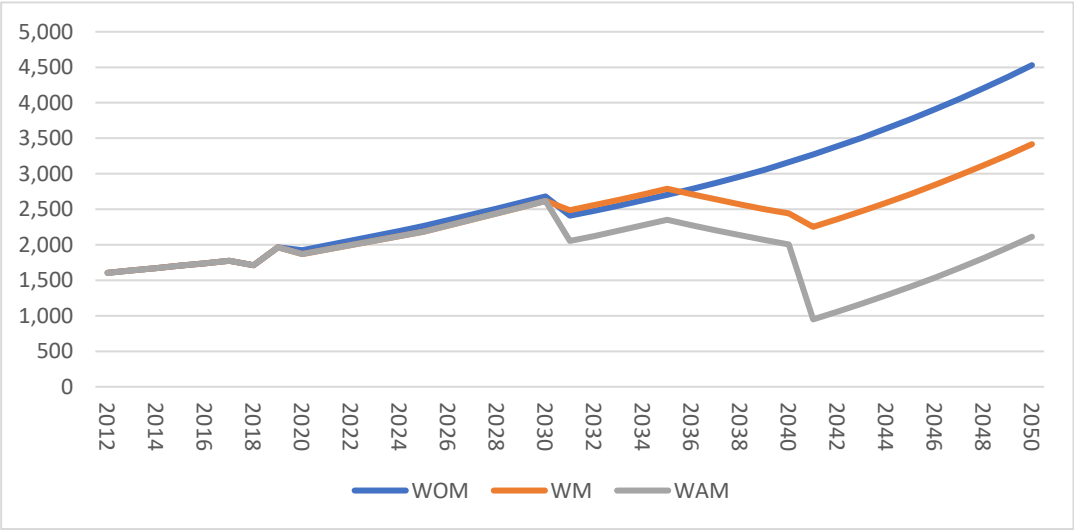
48. For the WAM scenario the addition of 400,000 electric vehicles by 2050 is expected to provide total 11,034 Gg CO_2eq. emissions reduction. More active promotion of a hybrid format of work would cause 40% reduction in traditional car use and total reduction of 9,351 Gg CO_2eq. within 10 years from 2041 (see Figure 4).

Figure 4. Transport (GHG emissions, Gg CO_2eq.)



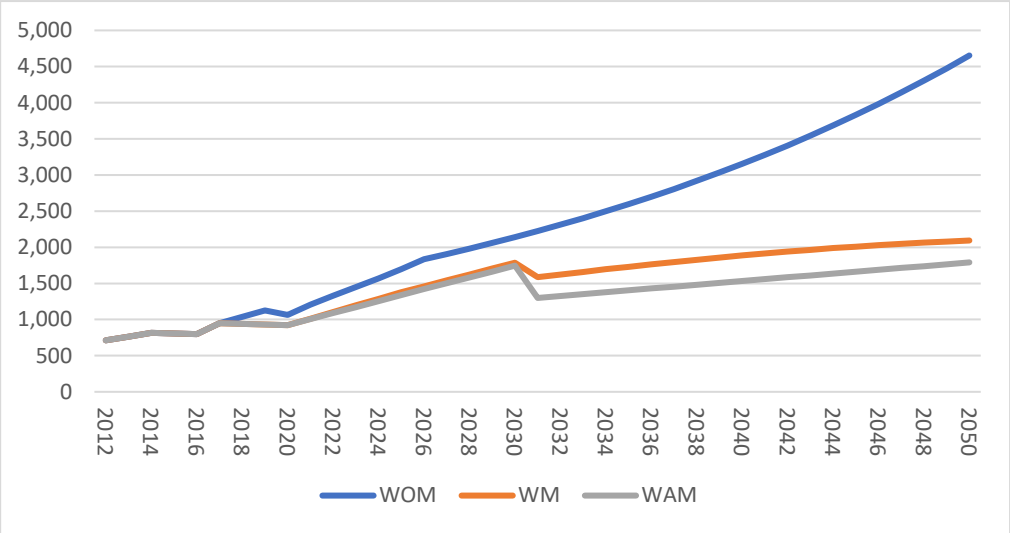
49. In the **buildings subsector** it is planned to continue to improve the energy efficiency of new and retrofitted buildings. In the WM scenario it will allow to reduce a total of 5,800 Gg CO_2eq. from 2031 to 2050. The WAM scenario assumes that annual reduction in 2050 would be 1,740 Gg CO_2eq., while total 20-years GHG emissions reduction would be 23,200 Gg CO_2eq. (see Figure 5).

Figure 5. Buildings (GHG emissions, Gg CO_2eq.)



50. In the **Industrial Processes and Product Use** reductions in GHG emissions will be achieved throughout modernization of equipment and upgrade of technological processes, primarily, in cement production. For the WM scenario total reductions from 2030 to 2050 are 3,492 Gg CO_2eq. In the WAM scenario more progressive measure would result in 9,223 Gg of CO_2eq. GHG emissions reduction for the same period of time (see Figure 6).

Figure 6. IPPU (GHG emissions, Gg CO_2eq.)



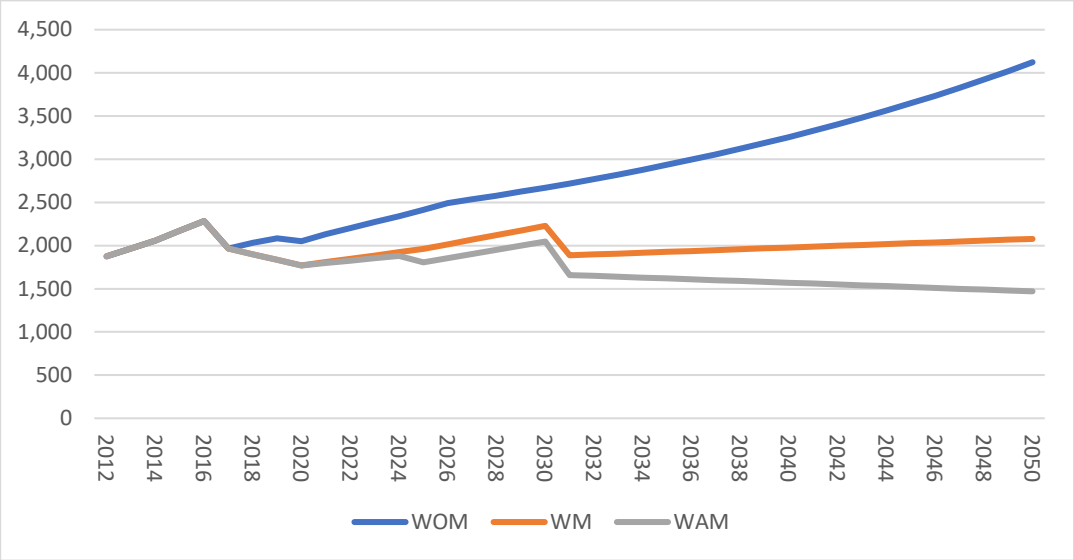
51. In the **agriculture sector** it is planned to reduce GHG emissions throughout manure management and implementation of metatanks for collection and subsequent use of biogas.

52. In WM scenario it will allow to achieve 3,240 Gg CO_2eq. reduction from 2031 to 2050. The WAM scenario implies 3,860 Gg of CO_2eq. reduction.

53. Reduction of energy consumption and improved irrigation conveyance efficiency in irrigation schemes implemented on 36,000 hectares in the WM scenario will reduce energy consumption and reduce water losses, thus, the total GHG reductions from 2031 to 2050 will amount to 1,313 Gg CO_2eq. Implementation of these measures on 232,000 hectares in the WAM scenario would help to gain 8,946 Gg of CO_2eq. reduction.

54. It is also planned to import cows with higher feed digestibility. 3 000 cows will be imported each year according to the WM scenario, which will reduce emissions by 1,206 Gg CO_2eq. during 20 years. 10,000 of new breed yearly or 380,000 by 2050 would cause 1,624 Gg CO_2eq. reduction as displayed in the WAM scenario (see Figure 7).

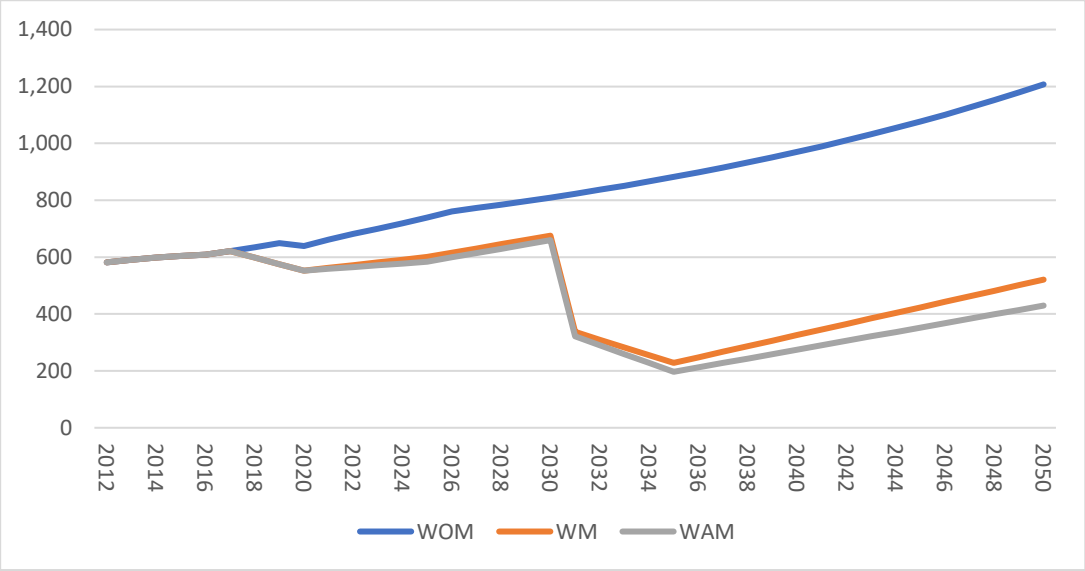
Figure 7. Agriculture, forestry and other land use (GHG emissions, Gg CO_2eq.)



55. Activities planned for the **waste sector** include establishment of landfill gas capture plants that will reduce a total of 5,880 Gg CO_2eq. over 20 years, and 140 Gg CO_2eq. in 2050 according to both WM and WAM scenarios.

56. The collection and use of biogas from wastewater treatment facilities with at least 50% of wastewater utilized in 2050 will reduce 735 Gg CO_2eq. between 2031 and 2050 according to the WM scenario. The WAM scenario requires complete utilization doubling the reduction to 1,470 Gg CO_2eq. (see Figure 8).

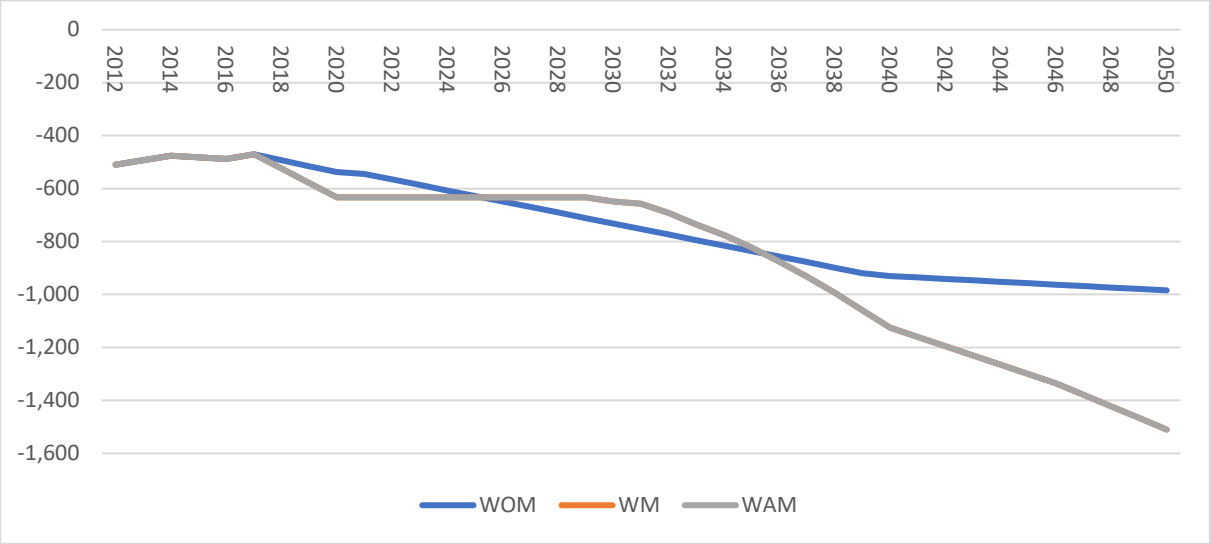
Figure 8. Waste (GHG emissions, Gg CO_2eq.)



57. In the **forestry sector**, it is planned to increase the forest area and its carbon sink potential. For the WOM scenario for 2050 targeted forest area is 439,000 hectares with total CO_2 removals of 17,811 Gg CO_2eq.

58. The WM and WAM scenarios envisage 450,000 hectares of forest covered area according to NDC, which will reduce emissions by 1,510 Gg CO_2eq. for the last year under review. In total, over 20 years, it is planned to absorb 21,934 Gg CO_2eq. (see Figure 9). The WM and WAM scenarios match.

Figure 9. Forestry (GHG emissions, Gg CO_2eq.)



6. PRIORITIES AND MEASURES FOR IMPLEMENTATION OF LT-LEDS

6.1 Structuring and classification of key actions

59. Significant reductions in GHG emissions and CO2 sink enhancement require fundamental changes in production and consumption patterns, major transition from the unsustainable combustion of fossil fuels to carbon-free technologies, large-scale application of green innovation in the energy, industry, transport, housing, agriculture, forestry, land use and waste management sectors. Therefore, actions of different nature and levels will be implemented.

60. **Supporting actions** include government programs to support initiatives in the field of GHG reduction and increase in GHG absorption (for example, support for the large-scale introduction of renewable energy sources), creation of energy independence of the country, creation of climate plans and national programs and various mechanisms for redistributing financing (for example, creation of specialized funds that deal with climate-projects).

61. The Government puts emphasis on measures aimed at maximizing the use of national energy resources (i.e. energy independence) and focuses on renewable energy sources and energy efficiency.

62. In order to support the economy on its path to decarbonization, the Government plans to introduce mandatory accounting for low-carbon activities through implementation of international standards (e.g. ISO standards). The possibility of introducing fiscal incentives for entities implementing low- and carbon-free technologies will be considered.

63. The Government also seeks to develop a “Debt-for-Climate” financial swap mechanism, which aims at leveraging additional finance into climate action.

64. **Market actions** include introduction of a GHG trading system, the purchase of green energy certificates and achievement of net zero greenhouse gas emissions.

65. Carbon pricing, even applied only to major emitters, could generate substantial drivers for decarbonization by expanding the impact of the pricing scheme in the supply-chain beyond these emitters. Furthermore, exposure to carbon border adjustment mechanisms will further drive decarbonization of the energy sector. Carbon revenue from a pricing scheme could be recycled to support new green finance instruments in Armenia.

66. **Limiting actions** include introduction of quotas for GHG emissions, introduction of internal and external taxes and penalties for exceeding certain limits on GHG emissions. The Government will consider introducing an internal carbon tax to protect businesses when exporting their products abroad.

67. LT-LEDS also targets policy and action changes at various levels.

68. On the **strategic level** the Government aims at achieving deep systemic shift towards the “decarbonization of public conscientiousness” throughout major framework and sectors wide policy initiatives, providing structural changes in economy, enhancing research, education and information sharing, offering fiscal incentives.

69. On the **tactic level** the Government mainly focuses on improving and adapting regulatory field in order to facilitate the emissions reduction and carbon sink growth in key sectors.

70. On the **technical level** the Government provides key sector-specific solutions, which in case of being implemented have a direct impact on achieving GHG emissions reduction and carbon sink targets assumed at the LT-LEDS model.

6.2 Sectoral priorities

71. The strategy includes priority actions in each sector aimed at reducing GHG emissions, which will be performed in parallel to implementation of key actions. They include:

1) Development of the guideline on integration of climate risks management considerations into sectoral and marz development strategies;
2) Development and implementation of the action plan to improve climate projections and early warning system;
3) Mapping and development of a database on climate change related risks;
4) Development of training modules to promote trainings on combating climate change for senior officials, decision makers and technical staff;
5) Development and introduction of a climate finance tagging system to track public and private expenditures related to climate change;
6) Establishment and improvement of the national system of measurement, reporting and verification.

Energy

7) Implementation of energy storage and mobility promotion measures;
8) Studies of opportunities and feasibility of utilizing biomass, biogas, hydrogen;
9) Creation of carbon absorption and storage technologies, parallel to their full-scale application at the international level;
10) Improvement of passenger flow management and transport infrastructure;
11) Expansion of the public transport network and improvement of the system;
12) Optimization of passenger and freight transport, creation and expansion of infrastructure for bicycles, electric scooters and walking
13) Enhancement of digitalisation and online services;
14) Ensuring renewal and modernisation of the vehicle fleet, including the bus fleet, with a gradual transition to vehicles using alternative energy sources/carriers (electricity, gas, biofuels, hydrogen).

Waste

15) Minimisation of solid waste (primarily biodegradable);
16) Minimisation of landfilled solid waste (primarily biodegradable);
17) Transition to sustainable landfill management practices;
18) Improvement of wastewater treatment technologies.

Agriculture

19) Promotion of the potential of organic farming;
20) Strengthening of national institutional capacities of technical knowledge and expertise on climate change mitigation and adaptation.
21) Strengthening of farmers' capacities through commonly used approaches such as communication, training, practical on-job training demonstration farms, farmers' field schools and establishing producers' networks for knowledge sharing;
22) Strengthening of capacities of agricultural advisory and support services including introduction of practices for mitigation and production enhancement, by providing access to the best practices and technologies and building capacity to implement them.

Land use

23) Deployment of sustainable land management system;
24) Reduction of soil erosion to ensure sustainable agriculture;
25) Decrease of the area of degraded lands (agricultural, arable, desertification-prone, solonchaks) where remediation measures have been taken and soil organic carbon content is stable or increasing;
26) Prevention of soil sealing;
27) Prevention of grassland conversion;
28) Improvement of water supply and irrigation;
29) Organization of restoration and maintenance of Lake Sevan.

Forestry

30) Nation-wide forest inventory;
31) Recalculation of the sequestration potential of forests based on the forest inventory data;
32) Improvement of forest management practices – implementing additional measures for reforestation, forest fires prevention, monitoring and fighting programs, improving forests pests and diseases control; rehabilitation of degraded forest ecosystems where needed, replacing monoculture reforestation technologies with mixed forests with higher absorption characteristics;
33) Research to generate new scientific knowledge about forests;
34) Application of new technologies aimed at reducing GHG emissions and increasing absorption of GHG in forests and other ecosystems.

Industry

35) Use of alternative building materials instead of cement with less or no GHG emissions;
36) Deployment of a system for increased responsibility of the producer;
37) Development of circular economy ensuring the decrease of waste in the value chain through deployment of resource efficient, waste free technologies and digitalization of the production processes;
38) Introduction of new production technologies with reduced GHG emissions combined with carbon capture and storage.

6.3 Key measures

72. Tables 2-1, 2-2 and 2-3 below present the lists of key measures, based on which LT-LEDS has been built. The estimated approximate cost of investments required for implementation of the proposed measures is also presented. The measures are presented according to their current status: approved by the RA Government, partially approved and new initiatives.

Table 2-1. Measures underlying the GHG emissions forecast model under the chosen scenarios (WM and WAM) – approved by the Government

Measure	Quantitative goals by 2050	With Measures WM			With Additional Measures WAM		
		Timeframe (year)	GHG emissions reduction Gg CO_2eq.	Estimated cost (AMD mln.)	Timeframe (year)	GHG emissions reduction Gg CO_2eq.	Estimated cost (AMD mln.)
Nuclear power							
• Implementation of the ANPP unit 2 design lifetime extension for 2026-2036 by 2030 • Construction of new nuclear unit with replacing capacity on the ANPP site after the expiration of the ANPP unit 2 design lifetime (including its extensions)	1,060 MW (WM&WAM)	2036 - 2050	Annual emission reduction in 2050 is **3,675** Total reduction is **48,946**	**147,000 – 650,000**	2036 - 2050	Annual emission reduction in 2050 is **3,675** Total reduction is **48,946**	**147,000 – 650,000**
Solar power							
• Solar PV construction according to the RA Energy Sector Development Strategy (until 2040) • Introduction of new SPV capacities in 2040-2050	700 MW (WM) 1,550 MW (WAM)	2031 - 2050	Annual emission reduction in 2050 is **668** Total reduction is **13,367**	Above **320,000**	2031–2050	Annual emission reduction in 2050 is **1,480** Total reduction is **22,248**	Above **650,000**
Wind power							
• Wind power construction according to the RA Energy Sector Development Strategy (until 2040), MW • Introducing new utility-scale wind power capacities, MW • Introducing residential wind power capacities, MW	610 MW (WAM)	–		Above **200,000**	2041 - 2050	Annual emission reduction in 2050 is **815** Total reduction is **8,348**	Above **300,000**
Hydro power							
• Construction and operation of new hydropower plants)	430 MW (WAM)	–		Above **65,000**	2031 - 2050	Annual emission reduction in 2050 is **608** Total reduction is **11,129**	Above **100,000**
Sequestration of carbon dioxide (forestry)							
• Increasing the forest coverage and forests absorption capacity	% of areas covered by forest	2031 - 2050	Annual emission reduction in 2050 is **1,510** Total reduction is **21,934**	–	2031-2050	Annual emission reduction in 2050 is **1,510** Total reduction is **21,934**	–

Table 2-2. Measures underlying the GHG emissions forecast model under the chosen scenarios (WM and WAM) – partially approved by the Government

Measure	Quantitative goals by 2050	With Measures WM			With Additional Measures WAM		
		Timeframe (year)	GHG emissions reduction Gg CO_2eq.	Estimated cost (AMD mln.)	Timeframe (year)	GHG emissions reduction Gg CO_2eq.	Estimated cost (AMD mln.)
Transport							
• Introduction of new electric vehicles	200,000 EVs (WM) 400,000 EVs (WAM)	2031 - 2050	Annual emission reduction in 2050 is **420** Total reduction is **6,620**	Above **420,000**[2]	2031 - 2050	Annual emission reduction in 2050 is **841** Total reduction is **11,034**	Above **450,000**
Fugitive emissions from natural gas transmission, storage and distribution							
• Lowering the share of natural gas in country's energy mix by introducing renewable energy resources	Reduction of fugitive emissions 67.54% (WM) - 66.87 (WAM)	2031 - 2050	Annual emission reduction in 2050 is **2,849** Total reduction is **45,312**	–	2031 - 2050	Annual emission reduction in 2050 is **3,004** Total reduction is **43,583**	–

[2] The estimated investment for construction of the relevant infrastructure has been calculated.

Measure	Quantitative goals by 2050	With Measures WM			With Additional Measures WAM		
		Timeframe (year)	GHG emissions reduction Gg CO_2eq.	Estimated cost (AMD mln.)	Timeframe (year)	GHG emissions reduction Gg CO_2eq.	Estimated cost (AMD mln.)
Industrial Processes and Product Use							
• Reduction of energy use and emissions from the cement industry, expressed per unit mass of cement product, is to reduce the clinker content of cement products. • Adoption of more fuel-efficient kiln processes to reduce emissions of combustion CO2 in cement industry. • Installation of power management systems and the utilisation of energy efficient equipment such as high-pressure grinding rolls for clinker comminution and variable speed drives for fans. • Generated electrical power and excess heat from the cement production process can be applied in cement plants. • Enhancing capacities of the SC in quality assurance of the fuel consumption data for industry subsectors and in other demand sector. • Efficient insulating lining to minimize the shell heat losses of equipment. • Specialisation and co-operation in the use of production facilities of the most modern energy-efficient technologies.	Energy savings Composition of cement	2031 - 2050	Annual emission reduction in 2050 is **391** Total reduction is **3,492**	–	2031 - 2050	Annual emission reduction in 2050 is **642** Total reduction is **9,223**	–

Table 2-3. Measures underlying the GHG emissions forecast model under the chosen scenarios (WM and WAM) – new initiatives

Measure	Quantitative goals by 2050	With Measures WM			With Additional Measures WAM		
		Timeframe (year)	GHG emissions reduction Gg CO_2eq.	Estimated cost (AMD mln.)	Timeframe (year)	GHG emissions reduction Gg CO_2eq.	Estimated cost (AMD mln.)
Transport							
• Gradual decline of 1% or 4% per annum in the traditional fuel vehicles market due to popularization of the hybrid format of work and reduction in need for daily transportation to the workplace.	10% (WM) 40% (WAM)	2041 - 2050	Annual emission reduction in 2050 is **324** Total reduction is **3,099**	–	2041 - 2050	Annual emission reduction in 2050 is **903** Total reduction is **9,351**	–
• "De-risking and Scaling-up Investment in Energy Efficient Building Retrofits" UNDP-GCF project • Increasing the efficiency of heating and cooling systems and introducing high energy efficiency standards for new buildings (class A). • Thermo-modernisation of existing buildings, not less than XX m2/year, connection of renewable energy resources installations for heat and power supply of buildings. • Automated (smart) control systems for lighting and heating in public areas. • Reduction of heat loss through hot water or air supply network. • Establishment of municipal energy management units.	Energy savings (GWh/year) At least % of residential and public buildings (retrofitted and new) meet energy efficiency requirements of at least class C	2031 - 2050	Annual emission reduction in 2050 is **435** Total reduction is **5,800**	–	2031 - 2050	Annual emission reduction in 2050 is **1,740** Total reduction is **23,200**	–
Agriculture, Forestry and Other Land Use (without Forestry and Other Land Use)							
• Reduction of methane emissions from cattle manures management	Captured methane	2031 - 2050	Annual emission reduction in 2050 is **200** Total reduction is **3,240**	–	2031 - 2050	Annual emission reduction in 2050 is **250** Total reduction is **3,860**	–
• Reduction of energy consumption and improved irrigation conveyance efficiency in irrigation schemes	Hectares (ha) with improved irrigation and drainage services 36,000 (WM) 360,000 (WAM)	2031 - 2050	Annual emission reduction in 2050 is **82** Total reduction is **1,312**	–	2031 - 2050	Annual emission reduction in 2050 is **825** Total reduction is **8,946**	–
• Reduction of methane emissions from the cattle's enteric fermentation. • Import, breeding of animals with high digestibility of fodder, crossing with local cows to improve the local Caucasian grey breed and reduce the number of the local breed.	The number of new breeds: 240,000 (WM) 380,000 (WAM)	2031 - 2050	Annual emission reduction in 2050 is **68** Total reduction is **1,206**	Above **400,000**[3]	2031 - 2050	Annual emission reduction in 2050 is **108** Total reduction is **1,624**	Above **600,000**

[3] The estimated investment for construction of the relevant infrastructure has been calculated.

Measure	Quantitative goals by 2050	With Measures WM			With Additional Measures WAM		
		Timeframe (year)	**GHG emissions reduction Gg CO_2eq.**	**Estimated cost (AMD mln.)**	**Timeframe (year)**	**GHG emissions reduction Gg CO_2eq.**	**Estimated cost (AMD mln.)**
Waste							
• CH4 emission reduction through the capture and combustion of landfill gas	Captured landfill gas	2031 - 2050	Annual emission reduction in 2050 is **140** Total reduction is **5,880**	–	2031 - 2050	Annual emission reduction in 2050 is **140** Total reduction is **5,880**	–
• Introduction of organic waste processing facilities (aerobic stabilization (composting) and/or anaerobic digestion with biogas and fertilizer production) and waste gasification plants (with energy and/or chemical production). • Biogas in all wastewater treatment plants.	Utilization of the sewage sludge, %	2031 - 2050	Annual emission reduction in 2050 is **70** Total reduction is **735**	–	2031 - 2050	Annual emission reduction in 2050 is **140** Total reduction is **1,470**	–

7. INVESTMENT AND FINANCING FRAMEWORK FOR LT-LEDS

7.1 Preliminary estimate of investments and financing mechanism

73. For implementation of the proposed measures the estimated indicative amount[4] of investments is from AMD 1,550,000 million (about USD 3,700 million) to AMD 2,700,000 million (about USD 6,500 million).

74. For implementation of LT-LEDS the following types of sustainability financing have been applied:

- **Green bonds:** bond proceeds are invested exclusively in projects that generate environmental benefits determined by defined criteria.
- **Transition bonds:** new asset class for the companies which have a key role to play in the shift to sustainable economy, but do not have the appropriate green assets to issue green bonds. Proceeds raised are used to finance projects with pre-defined climate transition-related activities.
- **Sustainability linked loans:** incentives for the borrower with lower cost of funding, if pre-agreed improvements in sustainability performance are being met and/or exceeded over the life of the loan.
- **Green equity funds:** a structured investment vehicle designed to channel capital from different investors into green businesses or projects. Investments may therefore include equity stakes in areas such as:
    - Renewable energy generation and development;
    - Water or waste treatment facilities;
    - Clean transport or electric vehicles.

75. Efficient sources of financing for Armenia include:

- Development finance institutions (DFIs) focused on implementing their government's foreign investment and growth agenda.
- Export credit agencies (ECAs) which provide insurance cover guarantees to lending banks to mitigate both political and commercial risks.
- Blended finance, which involves the use of financial instruments to catalyze private capital.

76. In terms of choice of financing mechanisms for LT-LEDS certain preferences are formed based on GHG emitting sectors, considering characteristics and financial drivers of the sector's players.

77. For the purpose of development of **energy** sector and reduction of GHG emission stable financing flows may be ensured from the following sources:

- Climate funds and multilateral development banks;
- Placement of sovereign and corporate green bonds;
- Closed-end investment funds;
- Equity crowdfunding platforms;
- Business angel networks.

[4] Investments required for measurable measures have been estimated. The calculated amounts are preliminary and are subject to additional analysis and calculation before launching the respective project. The financing mechanism will be determined at the start of each project.

78. The major share of the suppliers of **agricultural** production currently comprises small farms and households. This category needs new large-scale entrants, the financing means for which may take various forms, such as:

- Sustainability linked loans;
- DFI/international financial institution (IFI) finance;
- Grants (if the final product is to be used in charity);
- Private equity investments;
- Tax relief for businesses.

79. These forms of financing may be conditional on development and application of rotational grazing technology, improvement of gene bred in Armenia by import of new breeds. For implementation of the projects green securitization may also be used if municipalities and provincial administrations manage to group their households/producers by promoting breed change and manure handling projects.

80. Provision of grants to absorb transaction costs or exposure to certain risks can improve investment viability. Incorporating debt or equity into the capital structure of low carbon projects under favorable terms can also unlock returns.

81. In **industrial processes** sector the financing from GCF offers flexible interest rate for corporate sector companies achieving their environmental/sustainability KPIs.

82. With the expansion of the construction sector in Armenia, the demand for cement is growing, which enables the companies of the sector easily make a good use of sustainability linked loans and DFI/IFI finance for implementation of low-carbon cement technologies.

83. Currently Armenia does not have developed facilities for **waste** disposal and recycling. As raising finance for investment in modern facilities continues to be a challenge for Armenia, the municipalities might need to consider governmental assistance, grant issuance, DFI loans.

7.2 Introduction of cap-and-trade mechanisms

84. Creation of emissions trading system is an additional measure aimed at stimulating decarbonization practices of the most carbon-intensive industries.

85. Firms covered by the emissions trading system need to purchase an emissions allowance for each ton of CO_2 equivalent they inject. The total amount of GHG emissions that can be emitted by power plants and other industries is capped by the number of GHG allowances – cap. Under the cap, companies receive or buy GHG allowances that they can trade on an as-needed basis. The cumulative limit is set by the state body regulating the system and can be reduced every year, ensuring a reduction in total GHG emissions across the sectors covered by the system. Inefficient companies in terms of emissions may require additional allowances, while efficient companies, on the contrary, can trade in excess allowances.

86. Establishment of emissions trading system is at the initial stage in Armenia can act as a pilot mechanism for creating the cost of CO_2 equivalent, as well as for establishing the infrastructure for monitoring, reporting and verification (this infrastructure could also be interlinked with the CCMRV platform).

87. The system can be implemented in several stages to minimize the risks associated with additional legislative burden on businesses and to maintain the optimal level of measures aimed at reduction of GHG emissions. Key features for initial stage of Armenian emissions trading system may include:

- Applied only for power generators and energy-intensive industries;
- More than 95% of allowances are given to businesses for free;

- Establishment of the penalty for non-compliance with emissions trading system rules (especially non-compliance with monitoring, reporting and verification rules).

88. These steps will enable establishment of price for carbon, free trade in emission allowances across the country and the infrastructure needed to monitor, report and verify emissions from the businesses covered by the system.

89. Further improvement and development of the emissions trading system can be carried out through expansion of the coverage, reduction of cap on allowances, changing the principles of free issuance of allowances, tightening the liability in case of violations.

90. Another alternative or additional regulation measure for acceleration low-carbon transition in Armenian industry could be the introduction of carbon tax. Both reduce emissions by encouraging the lowest-cost emissions reductions. Both policies encourage investors and entrepreneurs to develop new low-carbon technologies and both policies generate government revenue that can be also used in fighting climate change.

91. A carbon tax offers stable carbon prices, so energy producers and entrepreneurs can make investment decisions without fear of fluctuating regulatory costs. In addition, if emissions reductions are cheaper than expected, which might occur if, for example, an economic downturn causes emissions to fall, tax provides a continuing price signal, whereas emissions trading system does not encourage reductions beyond the emissions target.

92. Apart from that the strategy achieving its goals considerably relies upon the impact of several key projects which are financed internationally and either are or will be implemented within next years.

8. MONITORING AND EVALUATION FRAMEWORK FOR LT-LEDS

93. To track quantitative targets, the Government establishes a unified system of measurement and evaluation of quantitative targets. The system includes three mean components

1) Data collection;
2) Monitoring and evaluation;
3) Reporting.

1) Data collection

94. Data collection is based on the international indicators used to track progress towards Sustainable Development Goal (SDG) 13 which evaluates the actions of countries in the fight against climate change. The Government plans that data collection will be organized into the following four groups:

- Reducing GHG emissions, which include CO_2, CH_4, N_2O, HFCs, SF_6;
- Number of people benefiting from the implementation of the measures;
- Amount of public funding in the field of low-carbon investment and development;
- Amount of private financing for low-carbon investment and development.

2) Monitoring

95. The monitoring of key indicators is ensured by Inter-agency Coordinating Council on Climate Change.

96. The Government will collect data annually for the dimensions identified in the previous section. Data collection is carried out both for the main target values in the field of reducing GHG emissions, and for sectoral ones (Table 3).

3) Evaluation

97. In carrying out the evaluation, the Government will rely on the following main criteria:

- Relevance - the extent to which the measure corresponds to the priorities and policies of the target group, recipients and donors,
- Effectiveness – the extent to which the measure achieves its objectives;
- Efficiency – the ratio of results in relation to the invested resources;
- Impact – positive and negative changes that were caused by implementation of the measure;
- Sustainability – whether the benefits obtained during the implementation of the measure will continue after the end of funding.

98. When implementing the strategy the following types of evaluation are planned:

- Annual evaluation;
- Mid-term evaluation of the national program or strategy;
- Evaluation at the end of the program or strategy;
- Post factum evaluation.

4) Reporting

99. The Government will publish information received after annual monitoring and evaluation in the reports of various nature. The main purpose of the reports is to inform stakeholders and decision makers about GHG emissions reduction activities, resources expended, progress towards goals and changes in ongoing projects.

100. Types of reporting:

- **Annual report:** Annual report notes the overall performance in the field of reducing GHG emissions, as well as the progress made
- **Semi-annual report:** Subtotals for the first half of the year are presented. It reflects an overview of the progress of measure, an overview of the implemented activities and resources attracted during the reporting period.
- **Final report:** This type of report is prepared immediately after completion of the measure. It sums up the measure and evaluates its contribution to reducing GHG emissions, and also captures a comprehensive assessment of the effectiveness and status of indicators at the end of the project

101. Reflecting on the vision established in the strategy and considering the NDC and Strategic Program for Development of the Energy Sector, the Government will review the strategy in full or partially as may be required.

Table 3. Key indicators for monitoring and evaluation

Indicator name	Brief description	Purpose	Indicator type	Presentation method
Gross GHG emissions	Total GHG emissions produced by all sectors	Fulfilment of international commitments	Direct result	Annual Semi-annual Final
GHG emissions by sectors	Final amount of GHG produced (including Land Use, Land Use Change and Forestry)/	Fulfilment of international commitments	Direct result	Annual Semi-annual Final
Sequestration of carbon dioxide	The amount of GHG produced by every sector	Fulfilment of international commitments	Direct result	Annual Semi-annual Final
Electricity distribution network losses	The amount of GHG removed or captured and stored	Fulfilment of international commitments	Direct result	Annual Semi-annual Final
Total installed capacity of small hydropower plants	The amount of electric energy not reaching final consumer due to technical imperfections	Losses reduction improves overall energy efficiency, therefore reduces GHG emissions	Energy efficiency	Annual Semi-annual
Total installed capacity of small and utility scale wind power plants	The amount of energy that all plants are able to produce at a peak performance	Increases the share of green energy in the RA energy mix, therefore reduces the volume of carbon dioxide	Final result	Annual Semi-annual
Total installed capacity of autonomous solar power plants	The amount of energy that all plants are able to produce at a peak performance	Increases the share of green energy in the RA energy mix, therefore reduces the volume of carbon dioxide	Final result	Annual Semi-annual
Total installed capacity of small solar plants	The amount of energy that all plants are able to produce at a peak performance	Increases the share of green energy in the RA energy mix, therefore reduces the volume of carbon dioxide	Final result	Annual Semi-annual
Increase the share of solar energy production in total	Growth dynamics of the total amount of energy supply from solar photovoltaic plants	Green energy is a key tool for reducing carbon dioxide emissions	Intermediate result	Annual Semi-annual
Battery energy storage systems capacity	The amount of energy that can be stored by battery system	Battery storage technology allows to accumulate green energy and use it when direct supply is not possible	Final result	Annual Semi-annual

Indicator name	Brief description	Purpose	Indicator type	Presentation method
Vehicle fleet renewal rate	The amount of old ineffective vehicles replaced by new ones	Old vehicles do not comply with energy efficiency standards and produce more GHG than new ones	Intermediate result	Annual Semi-annual
Electric vehicles growth rate	The number of electric vehicles coming to the market	Electric vehicles are a key tool for reducing carbon dioxide emissions in the transport sector	Intermediate result	Annual Semi-annual
Share of public transport in passenger transportation	The number of passengers using public transport instead of personal	Reduction of the share of private vehicles, direct reduction of GHG emissions	Intermediate/ Final result	Annual Semi-annual
Nitrous oxide emissions in organic fertilizers	The amount of nitrogen suboxide emitted throughout the application of organic fertilizers	Nitrous oxide is a powerful GHG – one of the main threats from agricultural sector	Intermediate result	Annual Semi-annual
Land coverage for herbaceous crops mixed with ryegrass	Size of land covered by herbaceous crops and ryegrass	Herbaceous crops are better at capturing and retaining carbon dioxide than more popular crops	Intermediate/ Final result	Annual Semi-annual
Number of high-yielding cows and new breeds	Number of cows of certain breeds	Reduce GHG emissions per kg milk by increasing milk yield per cow	Cost-effectiveness	Annual Semi-annual
Forest covered area	Size of forest covered areas	Increases the RA absorption capacity	Intermediate/ Final result	Annual Semi-annual
Restoration and sustainable management of degraded forests	Number of forests restored	Increases the RA absorption capacity	Intermediate/ Final result	Annual Semi-annual
Thermo-modernization of existing buildings	Dynamics of the use of energy-saving and heat-saving technologies	Improves overall energy efficiency, therefore reduces GHG emissions	Intermediate/ Final result	Annual Semi-annual
Share of residential and public buildings meeting efficiency class C requirements	Number of buildings certified for energy efficiency class C	Improves overall energy efficiency, therefore reduces GHG emissions	Intermediate/ Final result	Annual Semi-annual
Share of sewage sludge utilization	Amount of wastewater used for biogas production	Sewage sludge produces carbon dioxide, methane, nitrous oxide	Intermediate result	Annual Semi-annual

Indicator name	Brief description	Purpose	Indicator type	Presentation method
Share of collected waste	Amount of waste collected by a specialized operator	Reduction of methane emissions and development of circular economy	Intermediate result	Annual Semi-annual
Share of sorted out waste	Specially processed, recycled waste	Recycling of sorted out waste allows to reduce the amount of landfilled waste. Waste landfills are major sources of GHG emissions.	Intermediate result	Annual Semi-annual