



umweltbundesamt<sup>U</sup>



**SEIS and the environmental dimension of the SDGs – webinar series**

**within the project**

**“Improved environmental monitoring and assessment in support of the 2030 Sustainable Development Agenda in South-Eastern Europe, Central Asia and the Caucasus”**

**Webinar 2**

**“Towards clean, renewable and efficient energy use”**

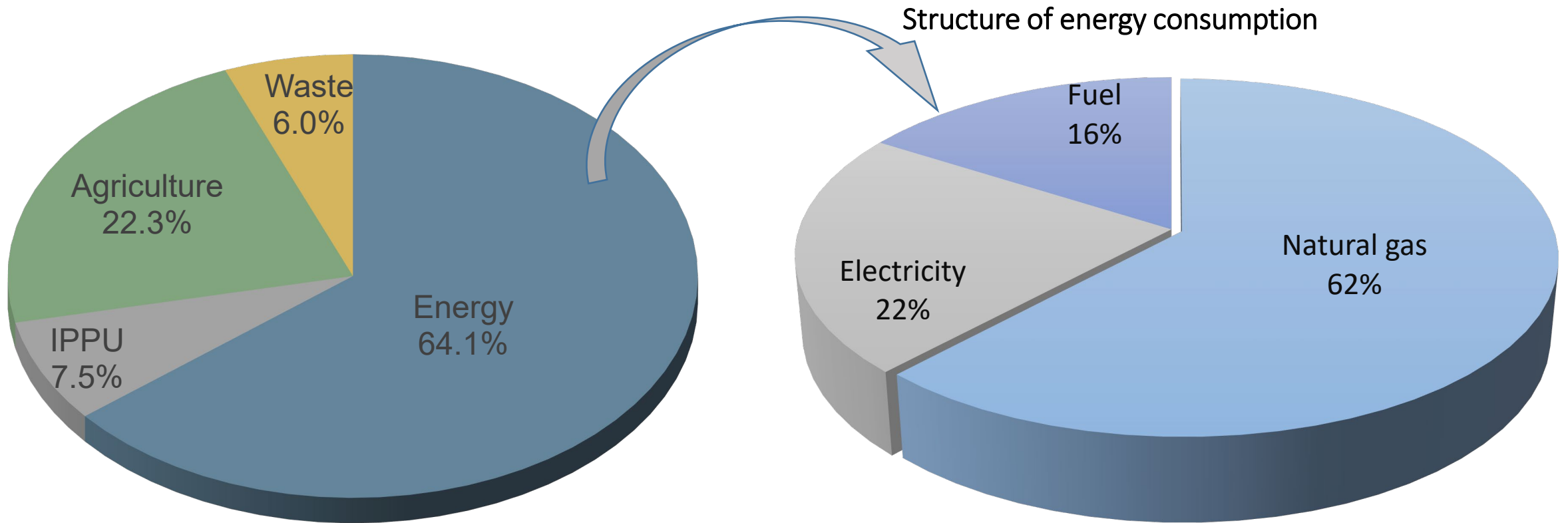
# Armenia's Experience in SDG7



Astghine Pasoyan

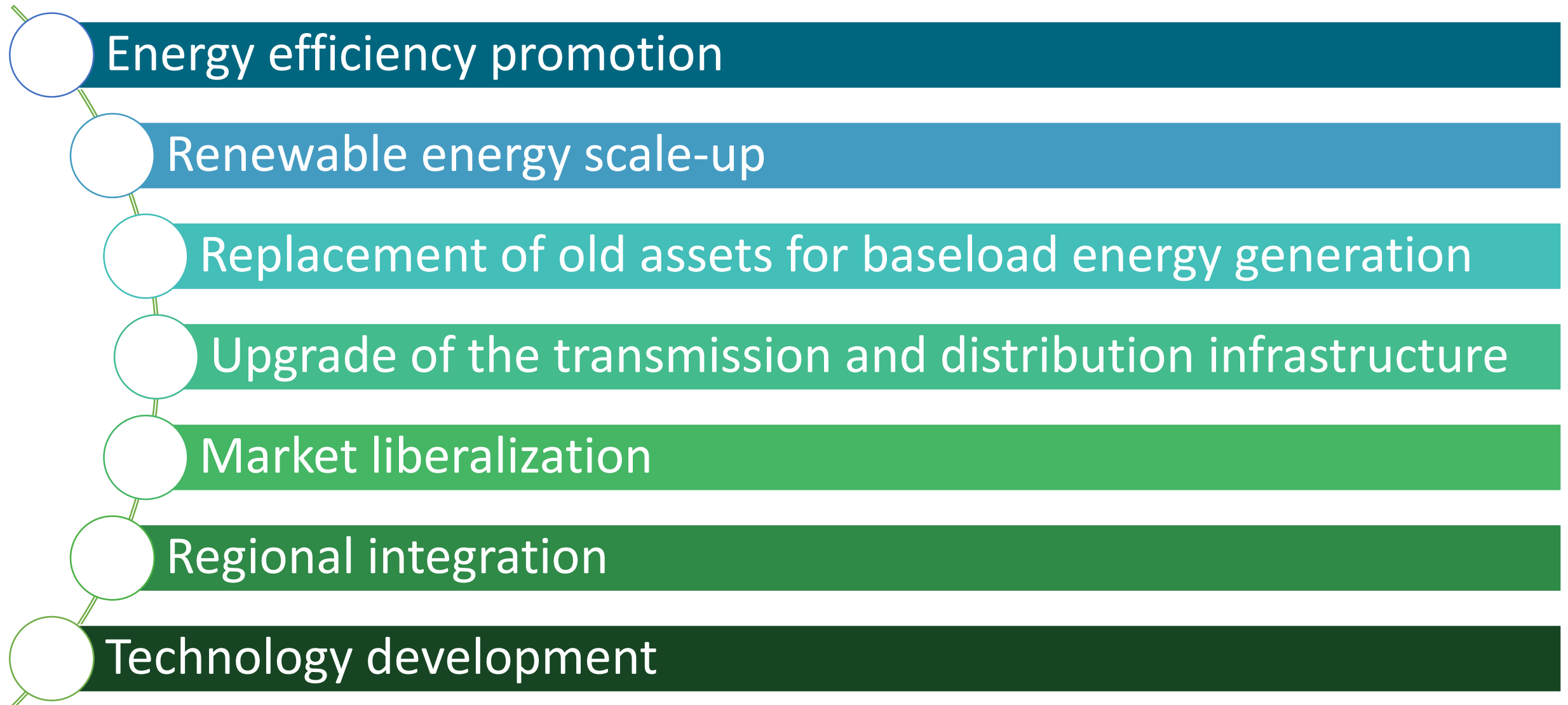
Energy Saving Foundation

# Armenia's Greenhouse Gas Emissions

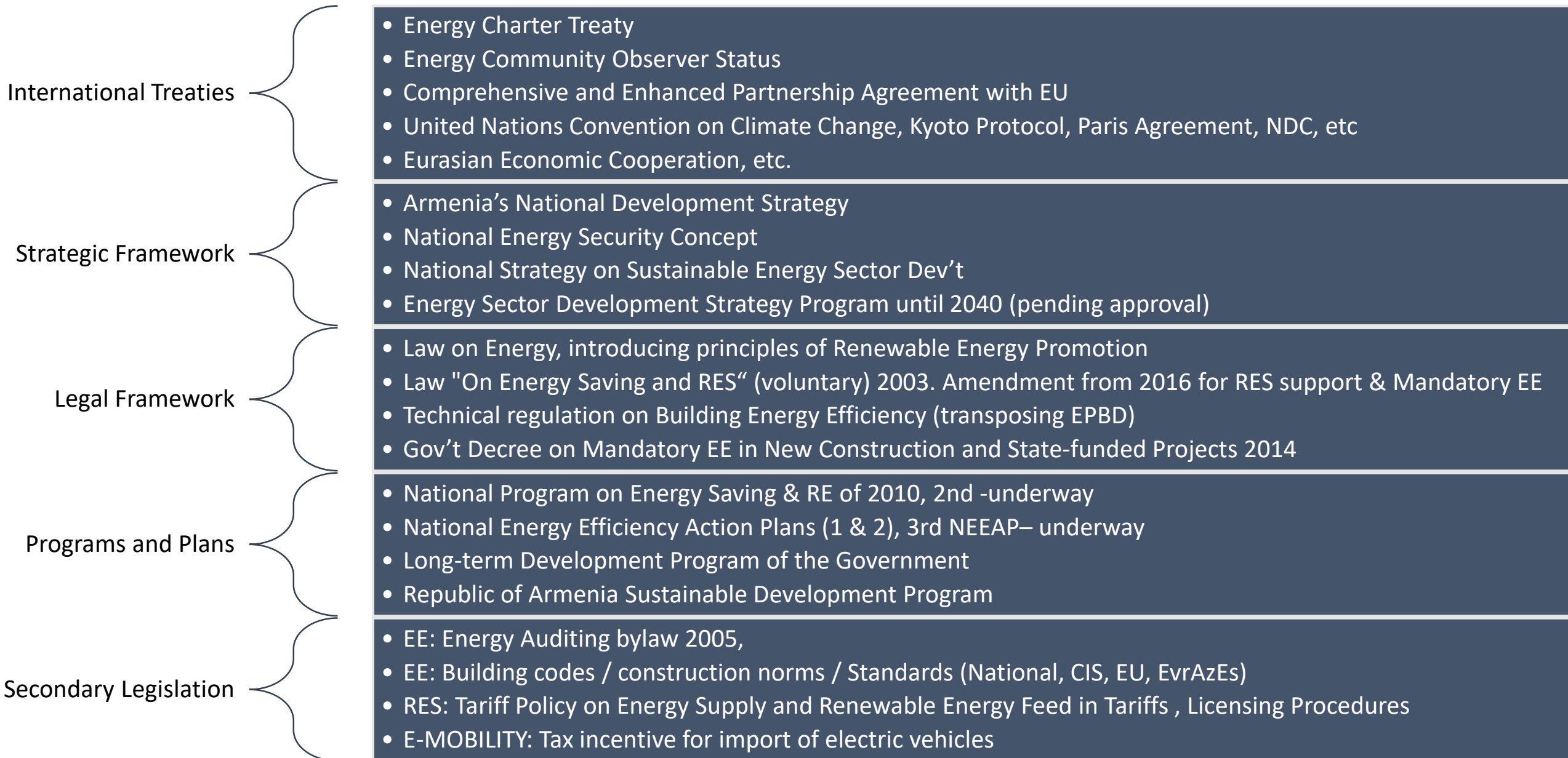


**GHG emissions by sectors (without Forestry and Other Land Use sub-sector) in 2016, CO<sub>2</sub> eq.**

# RA: Low-carbon development policies for the energy system

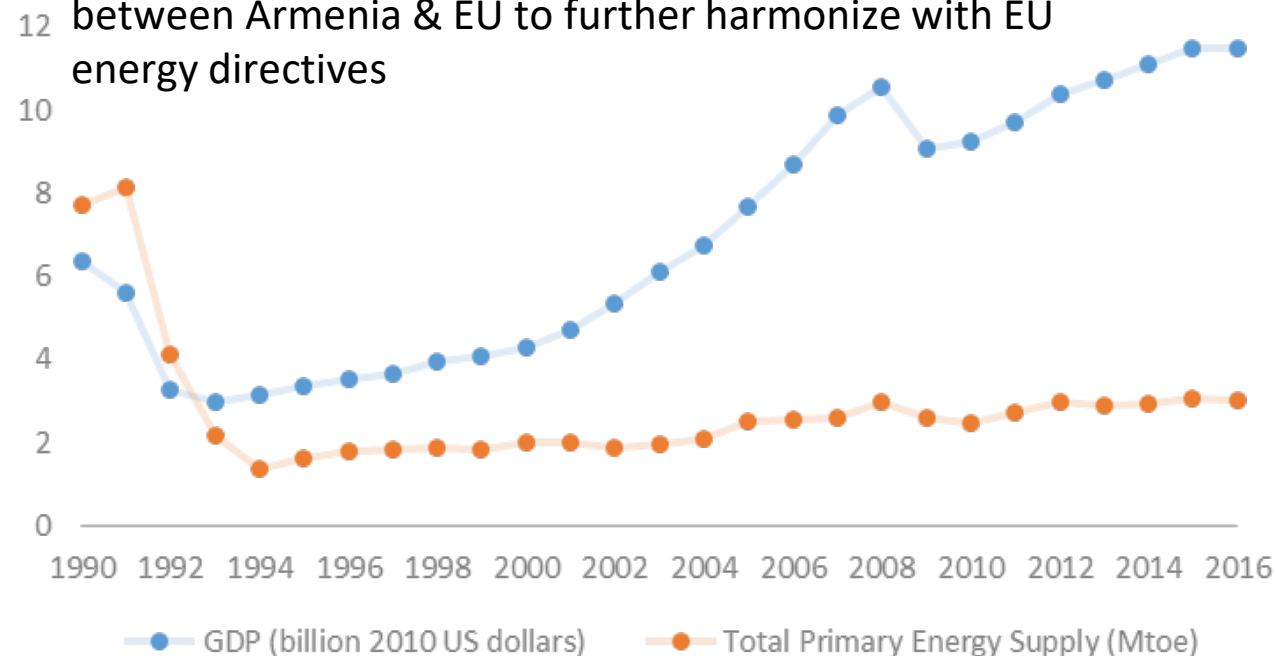


# Sustainable Energy Policy Framework in Armenia



# Evaluating Progress in Sustainable Energy

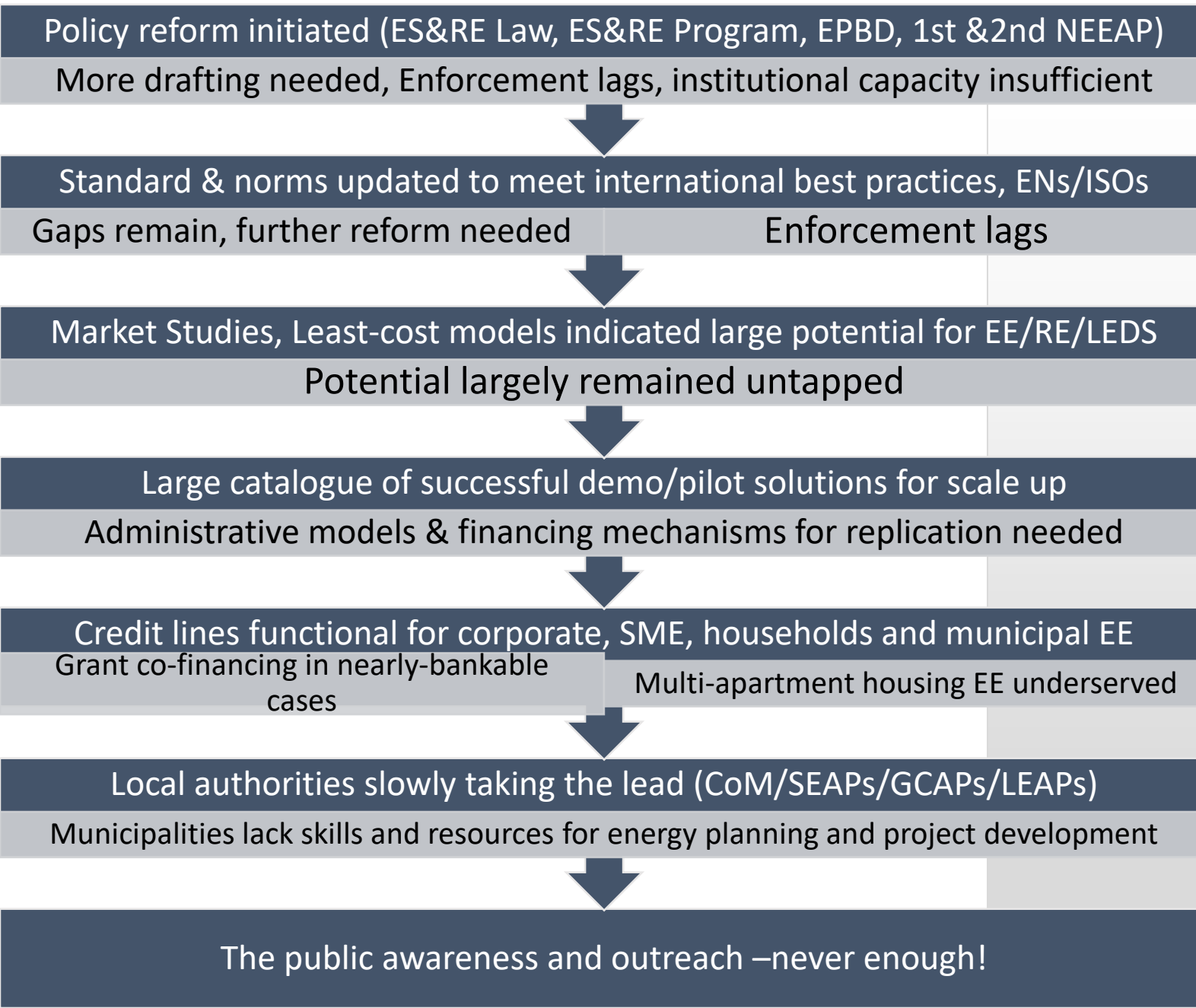
- Ambitious **legal-regulatory documents** adopted harmonizing with EU Energy Acquis
  - EE Directive, Energy Performance in Buildings Directive, Eco-Labeling Directive, RE Directive.
  - **pending enforcement provisions**
- **Institutions** in place with an elaborate legal toolkit to effectively address the policy needs of the sector,
  - **existing capacities need strengthening**
- **Comprehensive and Enhanced Cooperation Agreement** between Armenia & EU to further harmonize with EU energy directives



## Aggregate EE Assessment SCORECARD

	Energy Efficiency INDICATORS	Score (min-0; Max-5)
A	Indicator 1: National energy efficiency planning	5.0
B	Indicator 2: Energy efficiency entities	5.0
C	Indicator 3: Information provided to consumers about electricity usage	4.0
D	Indicator 4: EE incentives from electricity rate structures	2.2
E	Indicator 5: Incentives & mandates: large consumers	0.6
F	Indicator 6: Incentives & mandates: public sector	2.2
G	Indicator 7: Incentives & mandates: utilities	1.6
H	Indicator 8: Financing mechanisms for energy efficiency	3.1
I	Indicator 9: Minimum energy efficiency performance standards	0.6
J	Indicator 10: Energy labeling systems	3.2
K	Indicator 11: Building energy codes	2.5
L	Indicator 12: Carbon Pricing	4.0
M	Indicator 13: Energy Statistics	5.0
N	EE development tools	3.0
O	Education/capacity development	3.0
P	Public awareness	3.0

# Positive Steps & Successes to Date and Remaining Issues



Typical Energy Saving Results of Pilot Projects



# Energy efficiency: 1<sup>st</sup> & 2<sup>nd</sup> NEEAPs, 3<sup>rd</sup> under development



## Buildings

Residential: existing building retrofitting  
New construction:  
Regulatory framework



## Public sector

Public Buildings  
Services: Municipal  
Street-lighting, etc.



## Power & Industry

Power sector:  
generation (EE &  
RES),  
transmission,  
distribution  
  
Heavy  
industry/large  
enterprises  
  
SME



## Agriculture

Irrigation,  
Aquacultures,  
Greenhouses, etc.



## Mobility (transport)

Electric transport,  
Road  
infrastructure,  
Fuel switching,  
Decarbonized  
mobility



## Horizontal measures

policy measures (energy  
audits, SEAPs, public  
procurement,  
codes/standards, BATs,  
etc.),  
grants/subsidies,  
TA (audit templates, EE  
calculators, guidebooks,  
sample RFPs/contracts,  
ESCO development) and  
information (training,  
awareness, info.  
centers).

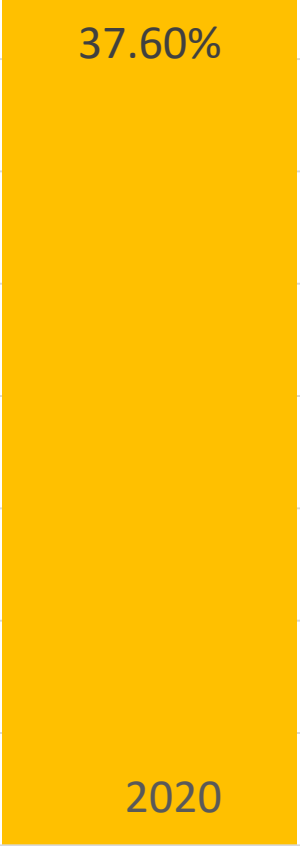
# Armenia's Progress against NEEAP 1 targets and NEEAP 2 Targets

Sector/Measure		Baseline Final Energy Consumption	Estimated annual savings SECTOR TARGET based on 2010 baseline (% and ktoe)		Sector target in 2014 (ktoe)	Baseline Final Energy Consumption	Estimated annual savings per measure based on 2010-2012 average baseline (% and ktoe)				Aggregated savings target by 2020	
		2010 (in ktoe)	annual/cumulated savings	Cummulative 1st NEEAP TARGET set for 2014 (in ktoe)	ACHIEVED	Avg for 2010-2012 (in ktoe)	Cummulative for 2017 (1st NEEAP)	Cummulative for 2017 (2nd NEEAP revised)	Cummulative for 2018 (1st NEEAP)	Cummulative for 2018 (2nd NEEAP revised)	in ktoe (1st NEEAP)	Cummulative for 2020 (2nd NEEAP revised)
I.	Horizontal /Cross-cutting	no target	NO TARGET									
			Cummulative ktoe			35.7			61.0		69.9	
II.	Buildings (Residential)	695.7	Cummulative %	2.7%	0.0%	750.5	9.9%	4%	13.5%	4.5%	23.0%	7%
			Cummulative ktoe	18.8	0.1		74.3	31.3	101.3	34.1	172.6	51.4
III.	Public & Private Service Sector	206.9	Cummulative %	1.7%	26.6%	267.9	6.1%	53.5%	8.4%	61.1%	14.6%	80%
			Cummulative ktoe	3.5	55.1		16.3	143.3	22.5	163.7	39.1	215.3
IV.	Industry & Power	358.3	Cummulative %	6.7%	0.4%	362.1	19.8%	10.3%	26.2%	14.7%	23.3%	80.5%
			Cummulative ktoe	24.0	1.4		71.7	37.3	94.9	53.1	84.4	291.6
V.	Transport /Mobility	499.6	Cummulative %	3.1%	14.1%	520.7	9.0%	17.7%	11.4%	19.0%	20.3%	22%
			Cummulative ktoe	15.5	70.6		46.9	90.4	59.4	96.7	105.7	109.5
VI.	Agriculture	140.1	Cummulative %	1.1%	0.1%	145.7	2.3%	2.77%	2.7%	4.8%	14.0%	7.4%
			Cummulative ktoe	1.5	0.13		3.4	4.0	3.9	7.0	20.4	10.7
VII.	Total	1900.6	Cummulative %	<b>3.3%</b>	<b>8.6%</b>	2047.0	<b>10.4%</b>	<b>18%</b>	<b>13.8%</b>	<b>20.7%</b>	<b>22.3%</b>	<b>37.6%</b>
			Cummulative ktoe	<b>63.3</b>	<b>163.1</b>		<b>212.6</b>	367.4	<b>282.0</b>	424.6	422.2	770.1
		22.10 GWh	Cummulative GWh	<b>0.7</b>	<b>1.9</b>	<b>23.8</b>	<b>2.5</b>	<b>4.3</b>	<b>3.3</b>	<b>4.9</b>	<b>4.9</b>	<b>9.0</b>



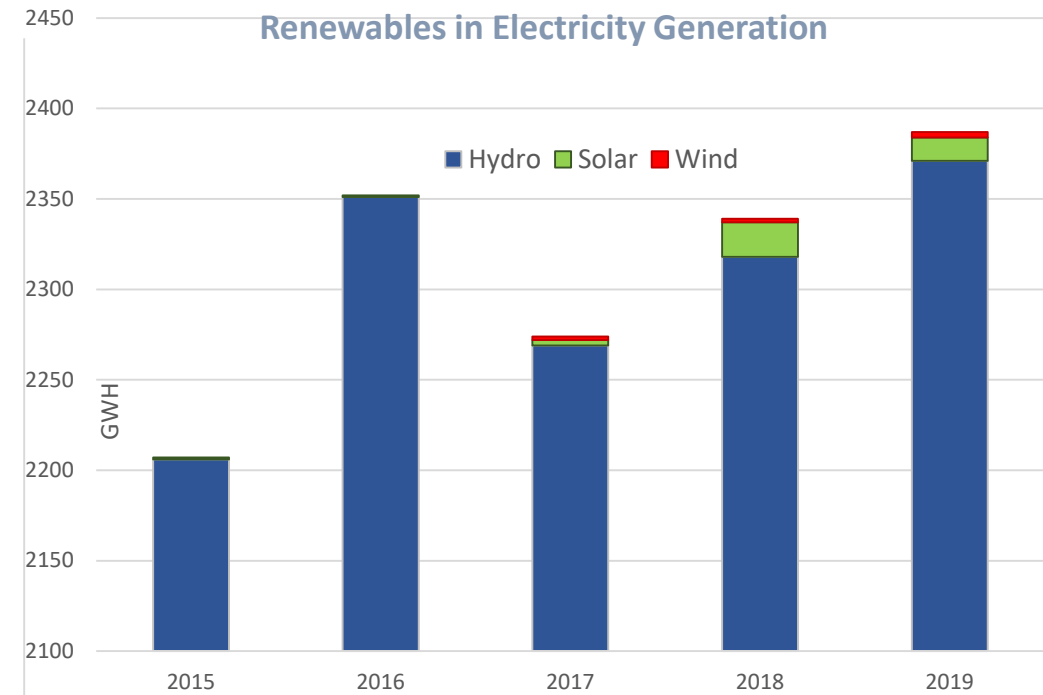
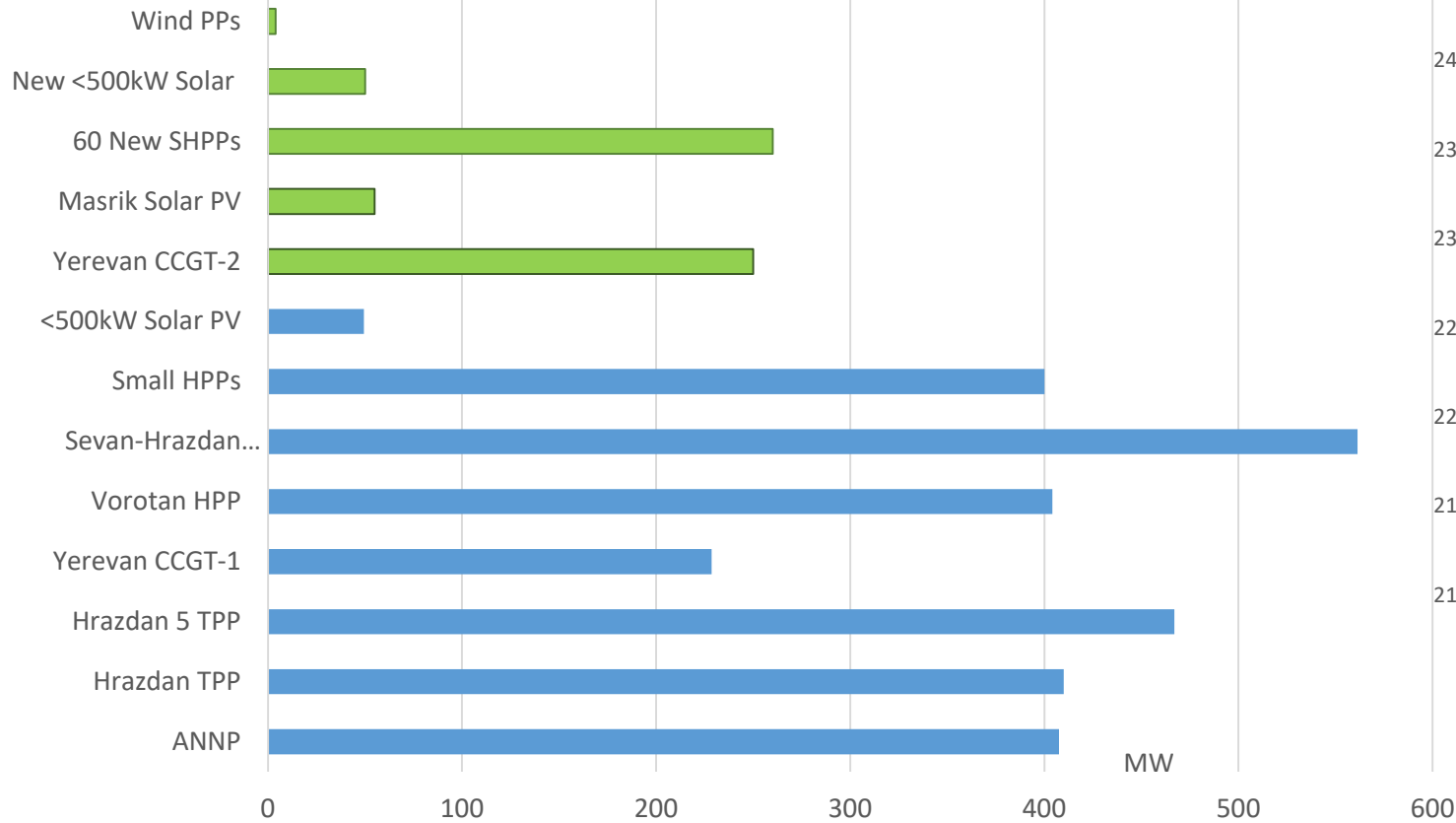
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V.	Transport /Mobily	499.6	Cummulative %	3.1%	14.1%	52	7%		0%			
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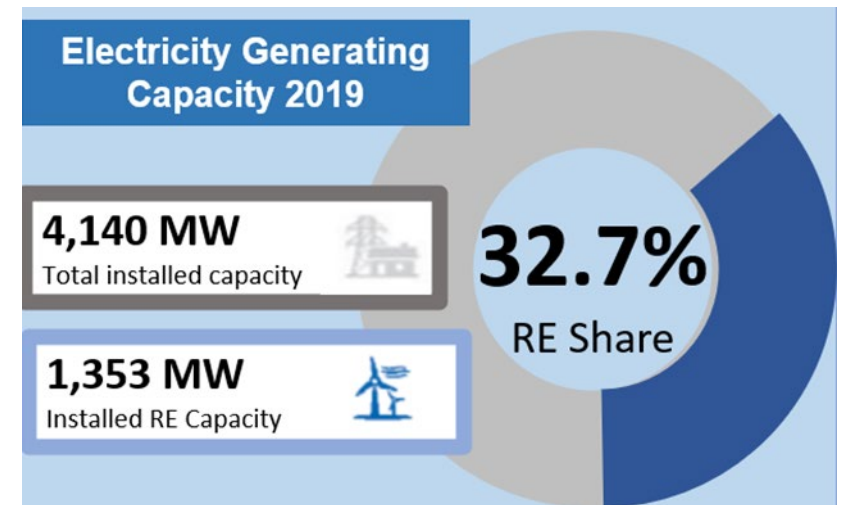


# Current and Pending Power Generation Capacities

Current & Pending Electricity Generation Capacities



	Biomass	Solar PV	Wind	Small Hydro	Total without large HPP
Installed Renewable Electricity Capacity 2019 in MW	0	17	3	370	390
Technical Potential for Installed Renewable Electricity Capacity in MW	29	1,169	795	91	≈2,084

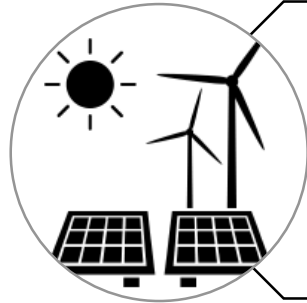


# Energy Efficiency & Renewable Energy Targets

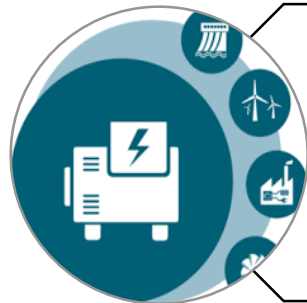


**37% by 2020 (NEEAP2)**

3<sup>rd</sup> NEEAP under preparation



**15% by 2030 (Energy Devt Strategy)**



**Extended nuclear beyond 2026**

# Visible Trends

## present

NG-based Gas-turbine TPPs

Increased share of RE, mainly due to the SHPP

Reliance on natural gas for heating

Increasing solar water heating

Independent solar PV boom

Natural gas operated vehicles (74%!)

300+ electric vehicles

## future

Higher efficiency of TPP - CCGT

Aggressive renewable energy promotion combined with market liberalization

- Wind Power farms
- Grid-Connected Solar
- Small-Scale PV/net metering/  
rooftop/SWH

Increased share of electric vehicles

Increased electricity exports through regional interconnections



**ONGOING: development of the draft of “National EE&RE Program for 2021 to 2030 and 3<sup>rd</sup> NEEAP based on intl best practices in:**

**National Energy Security Concept**

**Energy Development Strategy**

**National EE Action Plans**

**National Renewable Energy Action Plans**

**National Energy and Climate Plans**

**Low Emission Development Strategies**

Internal Energy Markets: interconnections, transmission, market integration, energy poverty

Least cost generation, diversification, security

EED & EPBD, CEPA

Scaling-up RE, CEPA

Decarbonization of the economy

Decarbonization, resilience, adaptation & mitigation

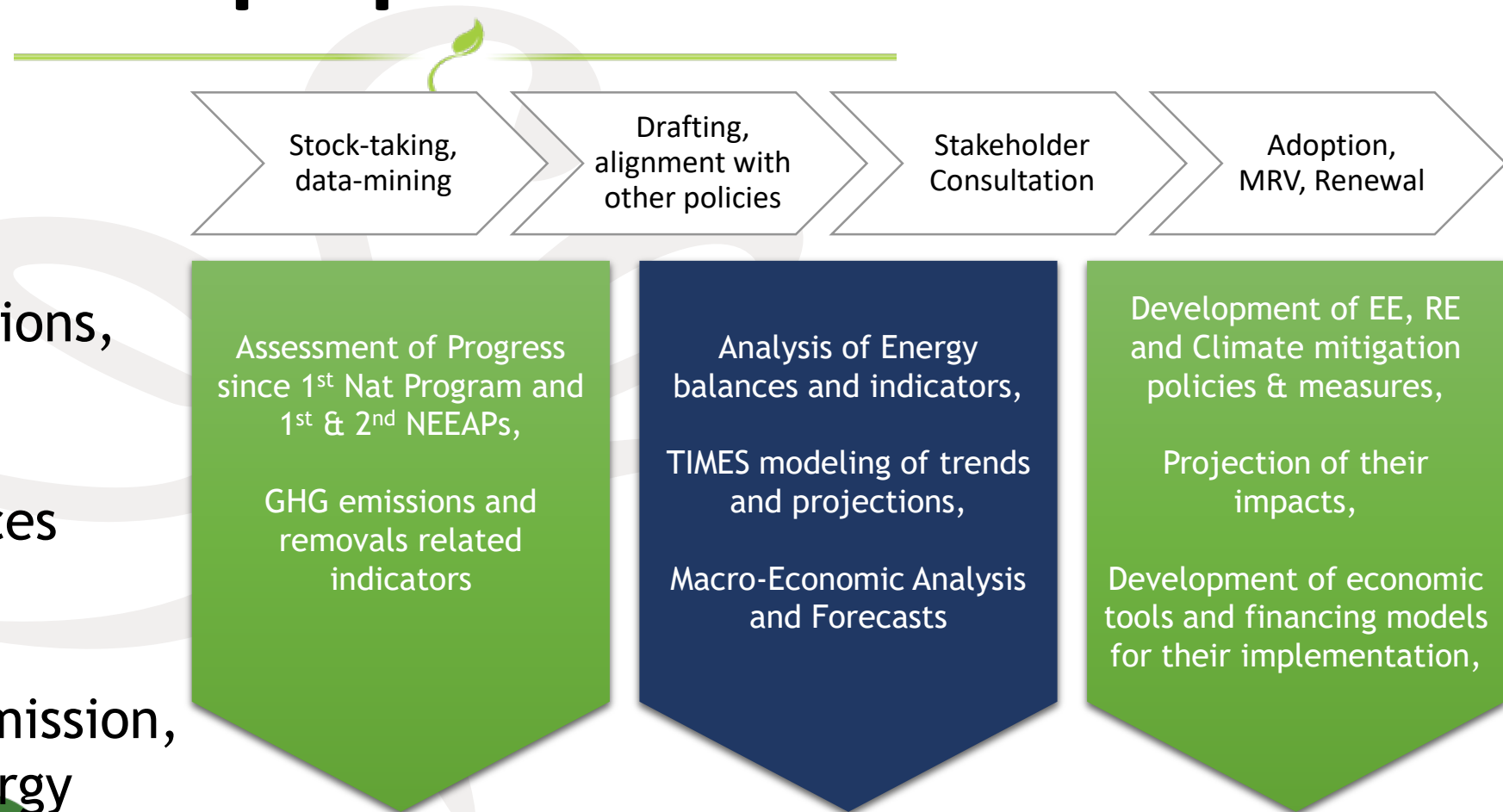


# Approach to National EE&RE Program

## for 2021 to 2030 and 3rd NEEAP preparation

### Key Elements

- Decarbonization of the economy: reduction / avoidance of GHG emissions, renewable energy
- Energy efficiency
- Renewable Energy Sources
- Energy Security
- Energy Markets: interconnections, transmission, market integration, energy poverty





# Thank you

[www.esfarmenia.org](http://www.esfarmenia.org)