



**MINISTRY OF ENERGY
INFRASTRUCTURES AND
NATURAL RESOURCES OF
THE REPUBLIC OF ARMENIA**

SUSTAINABLE ENERGY

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OUTLINE



SUSTAINABLE ENERGY:
SCALING UP
RENEWABLE
ENERGY CAPACITIES

SECTOR OVERVIEW

FOREIGN TRADE RELATIONS

RENEWABLE ENERGY

CONCLUSIONS

SECTOR OVERVIEW



SUSTAINABLE ENERGY:
SCALING UP
RENEWABLE
ENERGY CAPACITIES

PILLARS OF THE ENERGY SECURITY STRATEGY OF ARMENIA

Realization
of the
economically
viable renewable
energy
potential

Enabling
energy
efficiency

Diversification
of fuel supply,
regional
integration
and trade

Safe
operation
of the existing
nuclear units and
a construction
of new
units

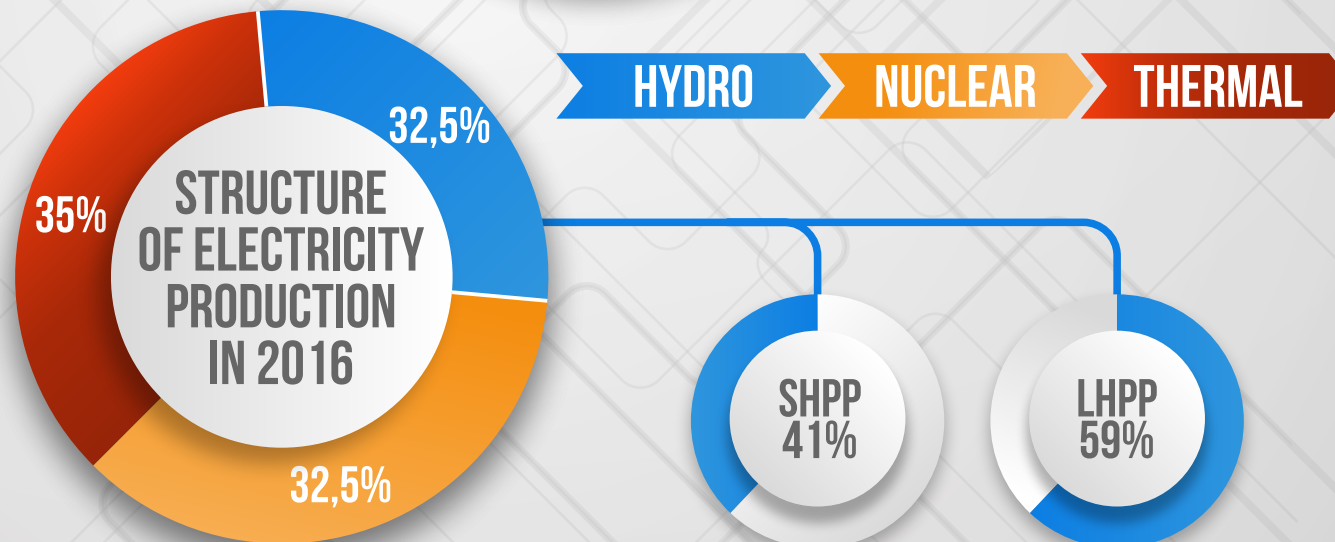
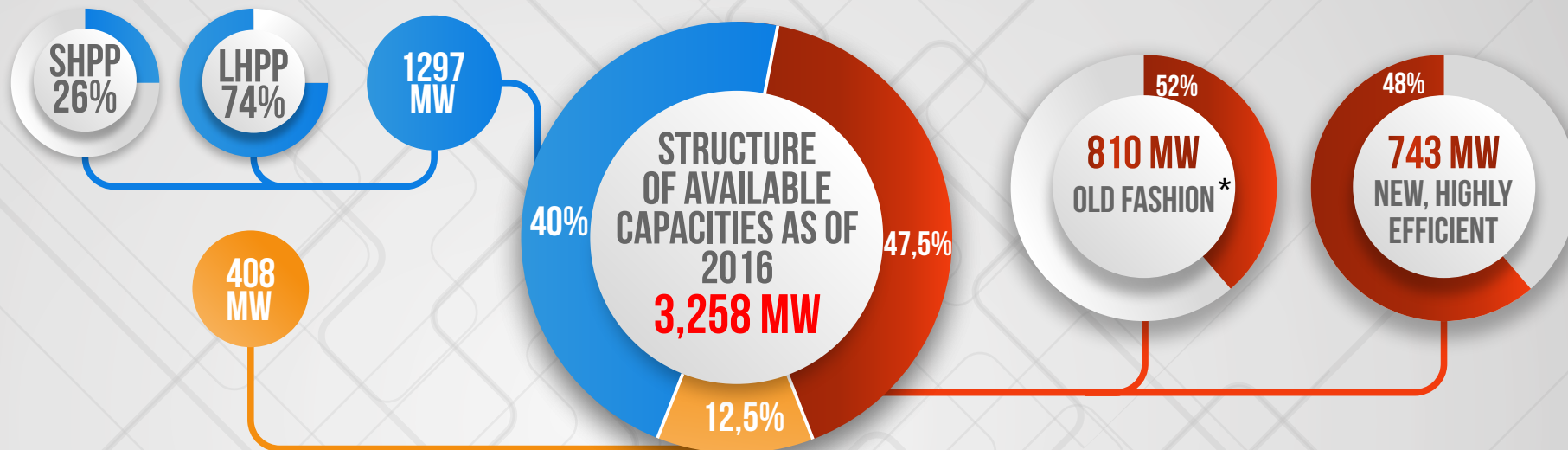
ENERGY POLICY OF ARMENIA

SECTOR OVERVIEW



SUSTAINABLE ENERGY:
SCALING UP
RENEWABLE
ENERGY CAPACITIES

ARMENIA IS A COUNTRY WITH DIVERSIFIED ENERGY MIX



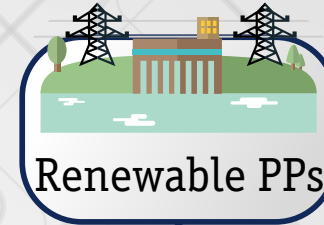
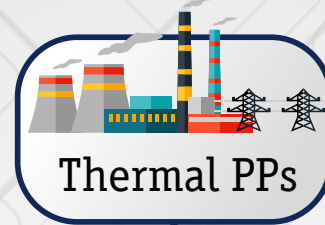
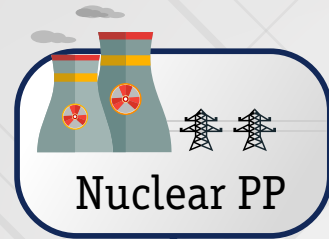
*To be replaced in 2019 with brand new unit

SECTOR OVERVIEW



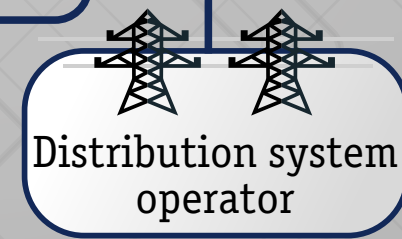
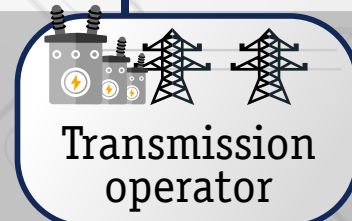
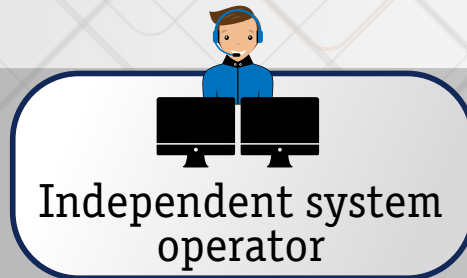
MINISTRY OF ENERGY AND
NATURAL RESOURCES OF
THE REPUBLIC OF ARMENIA
*Policy maker

STRUCTURE OF ARMENIAN POWER MARKET SINGLE BUYER'S MARKET



PUBLIC SERVICES
REGULATORY
COMMISSION
(PSRC)

*Regulates tariffs,
service quality
and licensing



Coming up: liberal market model with multiple suppliers and traders



SUSTAINABLE ENERGY:
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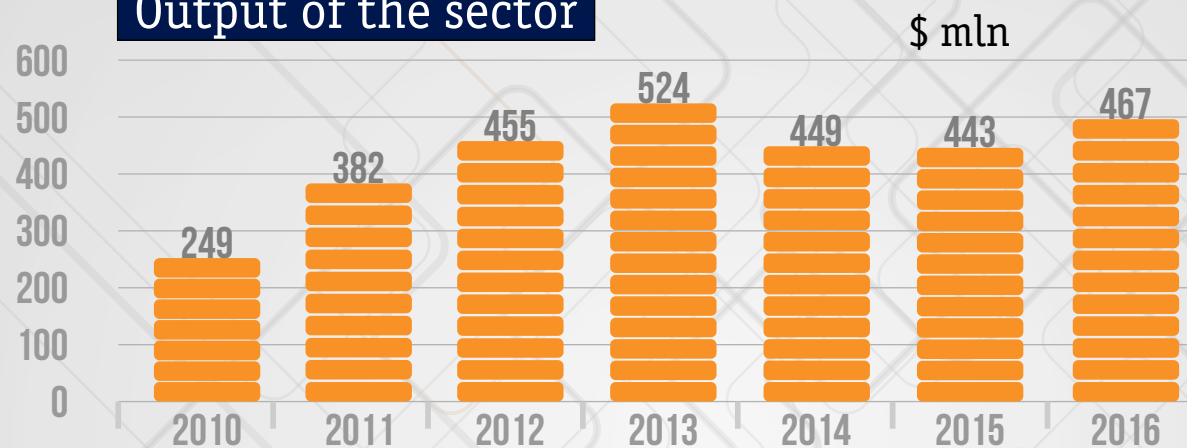
SECTOR OVERVIEW



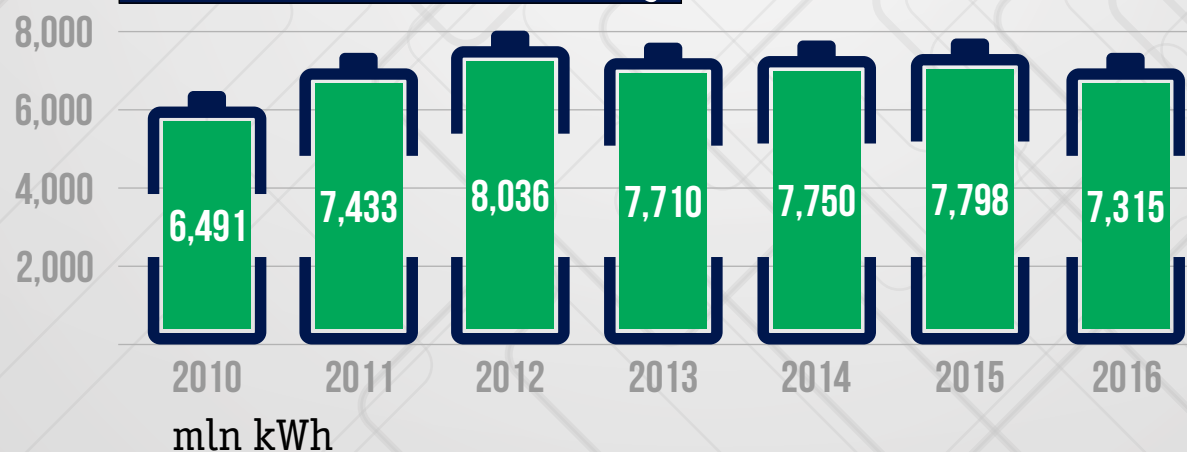
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THE SECTOR IN NUMBERS

Output of the sector



Production of electricity



Real growth
88%

2010 VS 2016

Real growth
>13%

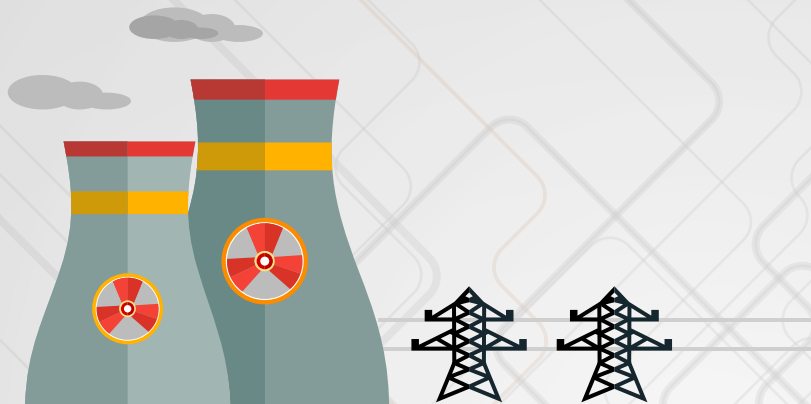
2010 VS 2016

SECTOR OVERVIEW



SUSTAINABLE ENERGY:
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MORE THAN 40 YEARS OF EXPERTISE IN NUCLEAR ENERGY

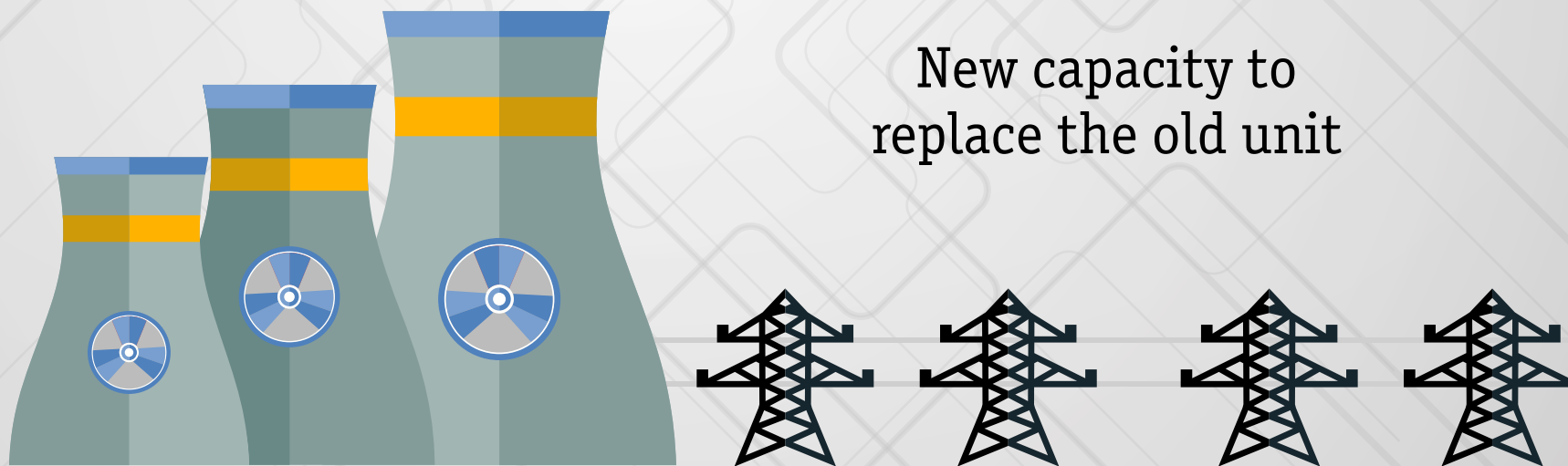


VVER – 440 (V-230)

Investments for upgrading
\$300 mln to prolong the
life cycle until 2026

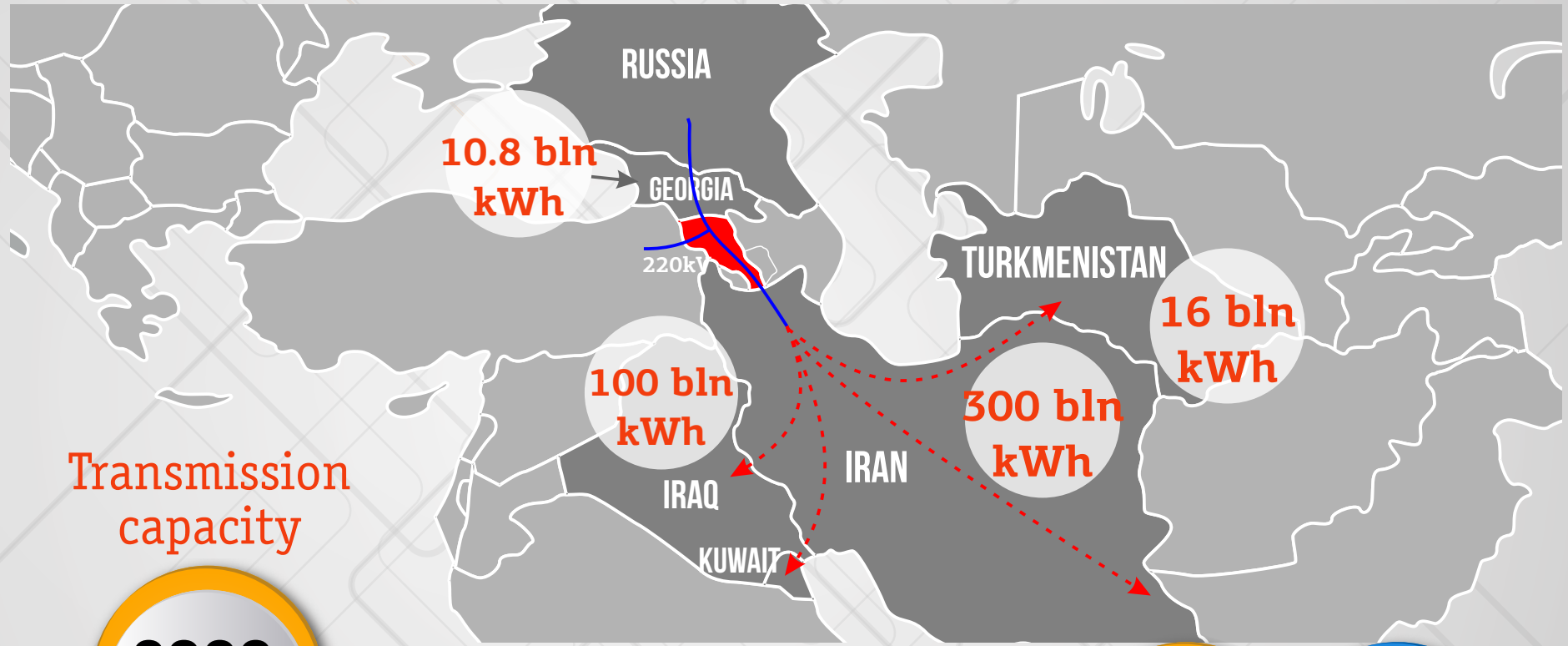
2026

New capacity to
replace the old unit



FOREIGN TRADE RELATIONS

ARMENIA HAS DEVELOPED INFRASTRUCTURE TO EXPORT ELECTRICITY



Transmission
capacity

2000
MW

- New 400kV high voltage grid that will increase export 7 times
- Bilateral agreements with Iran and Georgia
- Coming up: common energy markets in EEU



SUSTAINABLE ENERGY:
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RENEWABLE ENERGY

ENABLING AGGRESSIVE GROWTH FOR RENEWABLE ENERGY

Purchase of all produced electricity is guaranteed by the Law on Energy for 20 years from all renewable plants (15 years for SHPP)

Special Mechanism for Guaranteeing Payments to all Generation Capacities

Tariff for renewables are fixed up-front and cover main economic risks

Justified operation and maintenance cost

Currency fluctuation

Technical and commercial losses

Reasonable Rate of Return

Loan service costs

Mothballing and preservation cost

Price movement

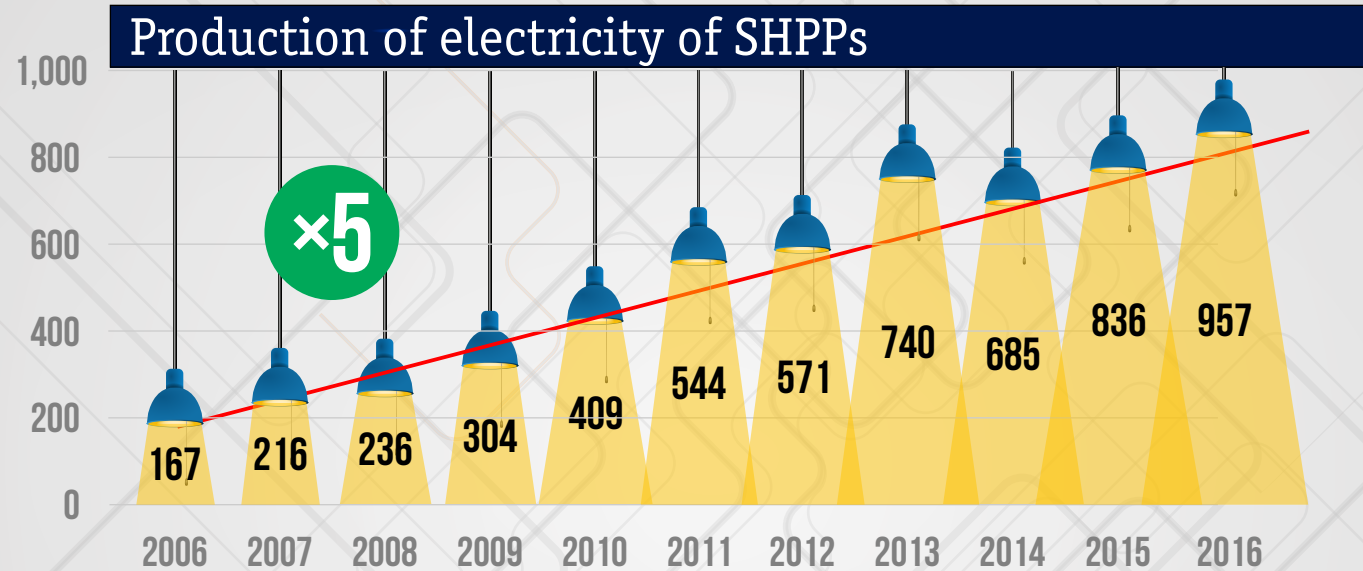
Other costs



**SUSTAINABLE ENERGY:
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RENEWABLE ENERGY

SUCCESS STORY OF SMALL HYDRO POWER SECTOR



×11
OF NUMBER
OF SHPPS

During last
10 years

All 182 SHPPs,
without an exception,
were built by private
investors

Estimated \$310 mln
of investments,
including FDI

There is still
potential for
growth



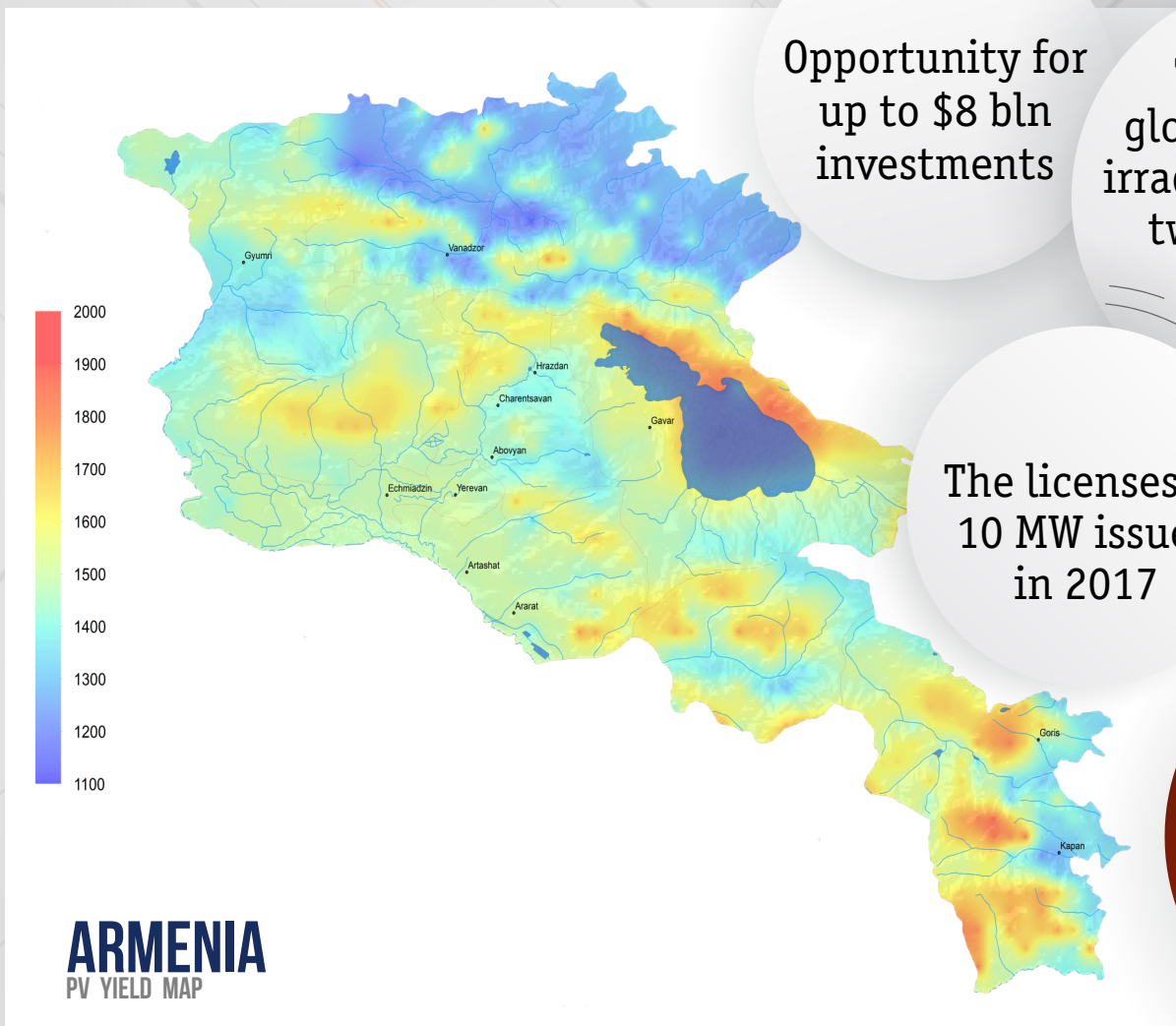
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RENEWABLE ENERGY



SUSTAINABLE ENERGY:
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OPPORTUNITIES IN SOLAR PV



ARMENIA
PV YIELD MAP

Opportunity for up to \$8 bln investments

The average global horizontal irradiation is about twice than the average in Europe

“Net-Metering”

First international bidding for the 55MW solar PV plant is to take place early 2018

The licenses of 10 MW issued in 2017

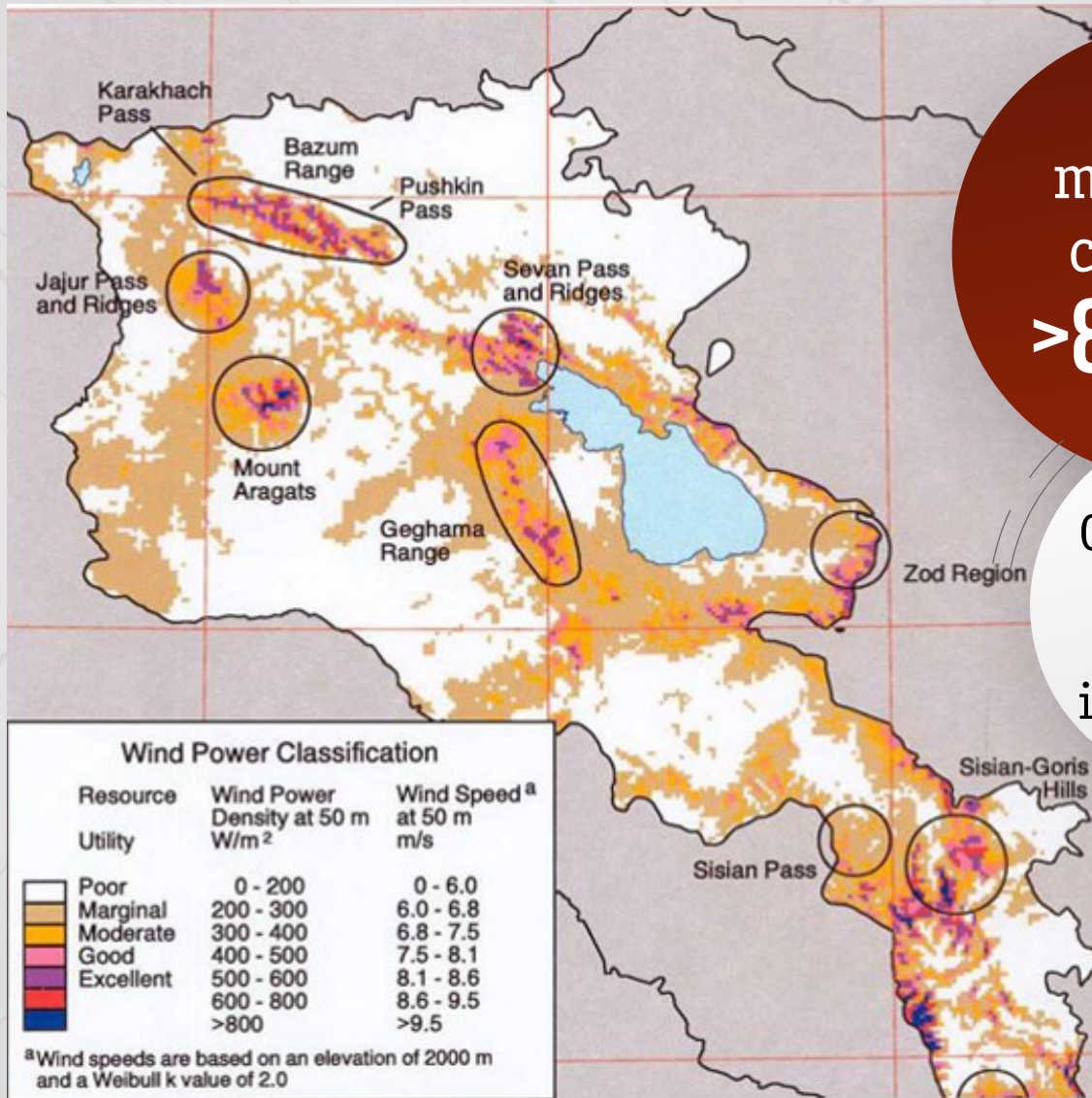
Total capacity 6.000 MW

RENEWABLE ENERGY



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OPPORTUNITIES IN WIND ENERGY



Total measured capacity **>800 MW**

Opportunity for up to \$1.2 bln investments

2 pilot projects are already Implemented, while multiple projects are in the pipeline

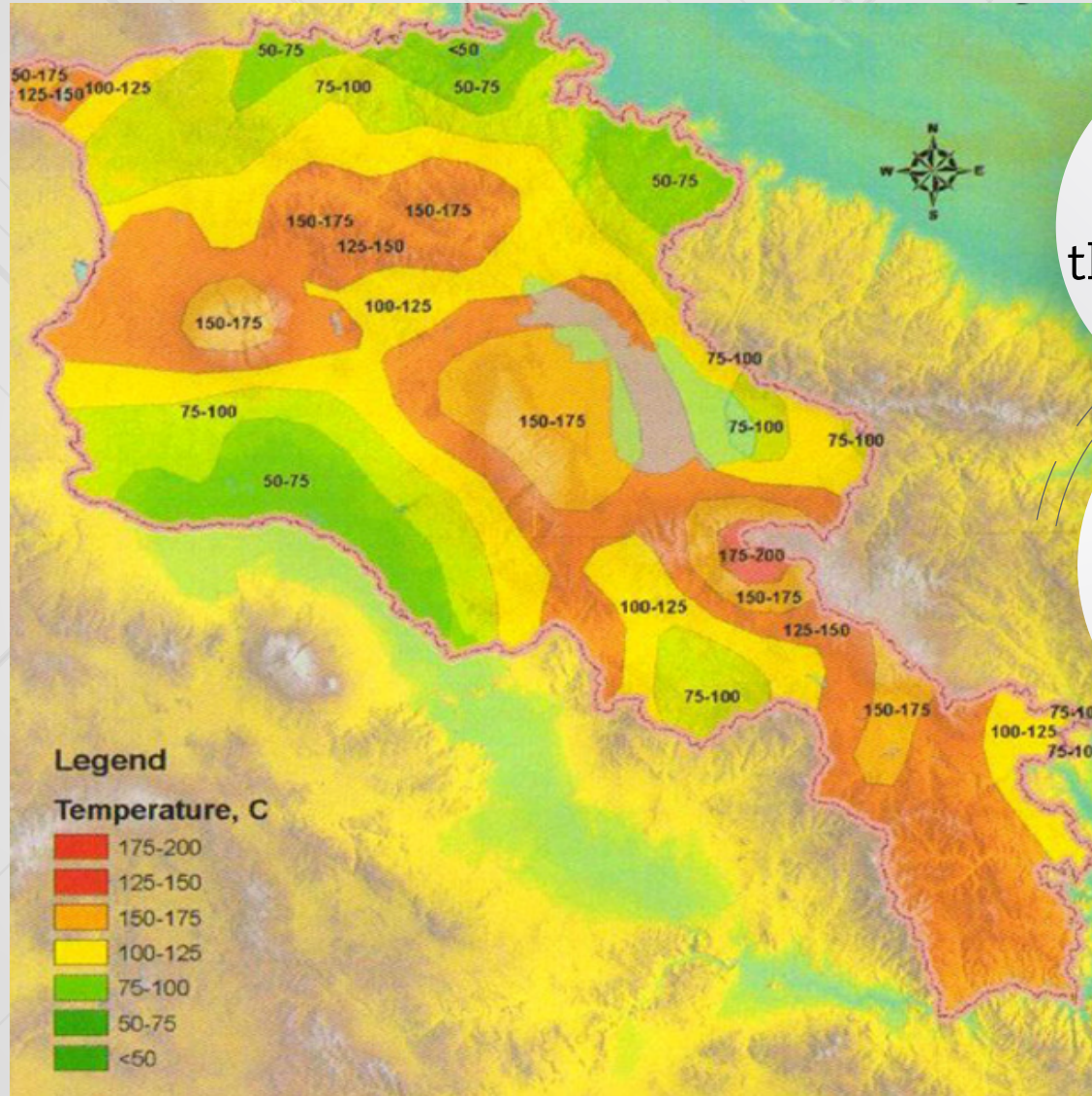
Target 2020-2025:
200 MW
wind parks

RENEWABLE ENERGY



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OPPORTUNITIES IN GEOTHERMAL ENERGY



First pilot project is in the exploratory drilling stage

International bidding for the construction rights is planned for 2018

Opportunity for up to \$100 mln investments

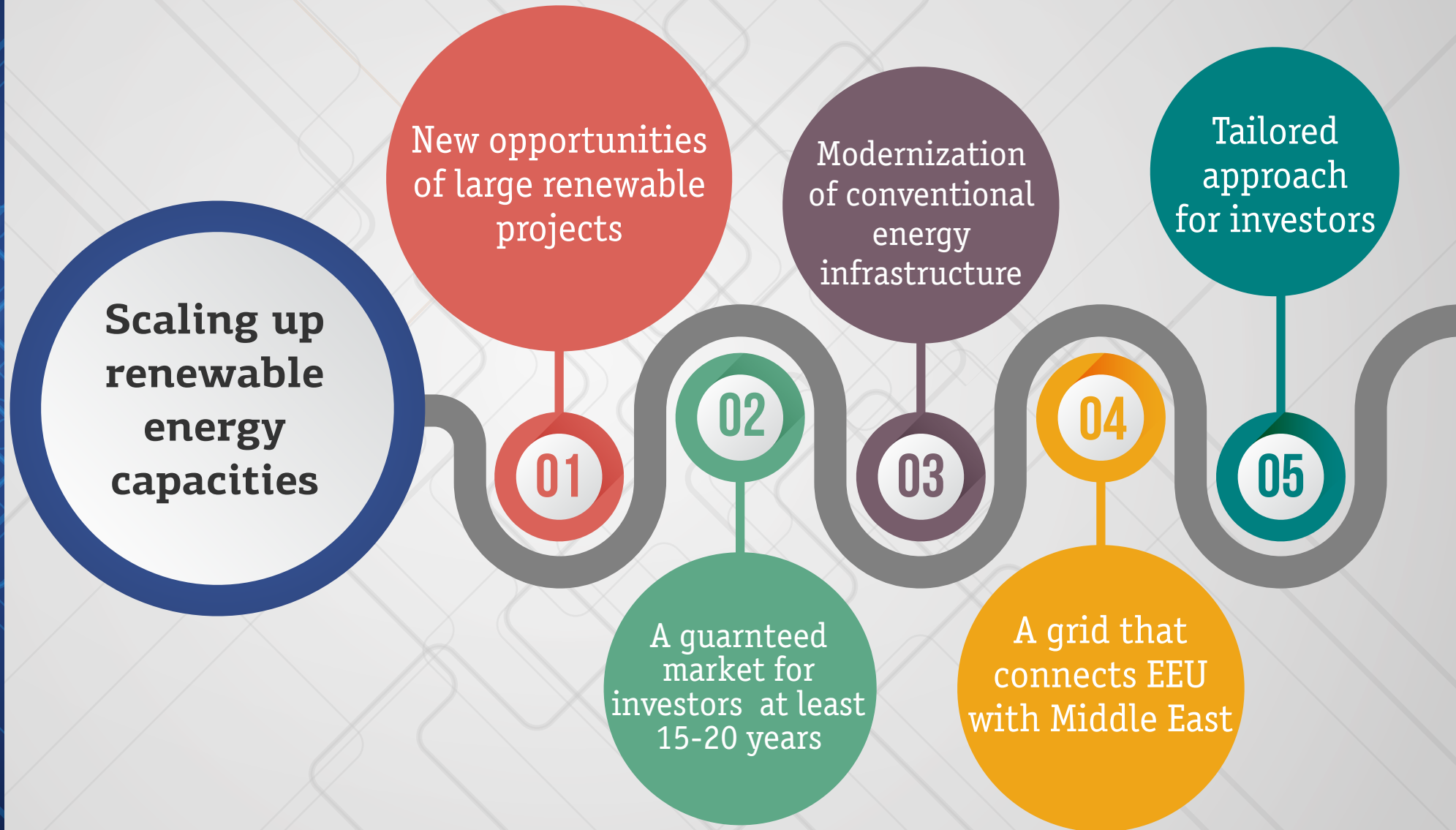
Additional 3 sites with high potential are identified

Total estimated capacity for the first site

30 MW

CONCLUSIONS

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