Republic of Armenia:
Maximizing Finance for Development in the
Power Sector

June 2021
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About ESMAP

The Energy Sector Management Assistance Program (ESMAP) is a global knowledge and technical assistance program administered by the World Bank. It provides analytical and advisory services to low- and middle-income countries to increase their know-how and institutional capacity to achieve environmentally sustainable energy solutions for poverty reduction and economic growth. ESMAP is funded by Australia, Austria, Canada, Denmark, the European Commission, Finland, France, Germany, Iceland, Italy, Japan, Lithuania, Luxembourg, the Netherlands, Norway, the Rockefeller Foundation, Sweden, Switzerland, and the United Kingdom, as well as the World Bank.

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Objective of this Study

Support the Government of Armenia to identify the constraints and develop a financing roadmap for mobilization of private and commercial financing in electricity generation and transmission in Armenia, while minimizing the impact on the end-user tariffs.

Power sector overview and required investments
- Summary of the existing power sector investment plans
- Summary of the key lessons learned from private investments into power sector

Identification of constraints to mobilization of private capital
- Review of existing structure of public debt for the power sector
- Readiness of power sector SOEs to borrow from capital market
- Assessment of availability of commercial financing

Recommendations to overcome identified constraints
- Identification of key measures to enhance the prospects for mobilization of private capital
- Recommending options for accessing capital market

Tariff impact assessment and social mitigation
- Tariff impacts of increased commercial financing
- Mitigation of impacts

Overview of potential WBG support
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- Financing of Power Sector Investments to Date
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- Constraints to Raising of Additional Capital
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- Tariff Impacts of Long-Term Commercial Financing
- Potential World Bank Group Support
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Synopsis of Main Issues and Solutions
1. Absence of Framework for Public Investment Management with
   - Clear definition of project cycle related institutional responsibilities
   - Technical, economic, financial, environmental and social criteria for prioritization
   - Framework for evaluation of project risks, design of mitigation measures, and risk management
   - Project management, implementation, monitoring, and handover arrangements
   - Clear procedure for prioritization of projects

2. Inefficiencies in PPP Project Cycle
   - Project pipeline development bottlenecks
   - Lack of funding for project preparation
   - Prevalence of unsolicited proposals
   - Absence of model contractual documents
   - Institutional capacity constraints to prepare and implement PPPs
   - Lack of framework for assessment and management of government financial commitments under PPPs

3. Lack of Predictability of Tariff Revenues for Regulated Power Sector State-Owned Enterprises (SOEs)
   - Annual review and approval of operating and maintenance (O&M) expenditure does not create incentives for power sector SOEs to improve efficiency and reduces predictability of cash flows for potential long-term commercial lenders
   - Lack of transparent methodology for computation and regular adjustment of return on assets (WACC on regulated asset base) is not conducive for attracting long-term commercial financing in SOEs
4. Shortcomings in Corporate Governance

- **Boards of Directors**: (a) not empowered by corporate documentation, (b) non-clear division of responsibility, (c) absence of specialized committees for effective oversight of companies’ activities, (e) lack of clearly formulated compensation mechanism, and (e) irregular performance evaluation.

- **Performance Monitoring & Management**: (a) SOE management is not accountable to the Board of Directors for implementing the strategy and adhering to the set operational and financial targets; (b) absence of linkage of SOE strategy and objectives with performance indicators and targets; and (c) SOE management remuneration is not linked to SOE performance and achievement of objectives.

- **Financial Reporting, Audit & Disclosure**: (a) HVEN has no Internal Audit function; and (b) SOEs do not publish their annual reports and corporate governance statements at the company website.

- **Corporate Documentation**: (a) Board of Directors do not have proper delegation of authority to carry its functions effectively; and (b) no Code of Ethics needs to be introduced.

5. Limited Availability of Long-Term Financing

- Lack of interest from international lenders & local pension and investment funds due to lack of pipeline and relatively small size of projects.

- Limited utilization of fintech innovations, such as crowdfunding, to increase availability of capital for small project financed deals.

- Limited knowledge of project financed by local capital market.
SYNOPSIS
Solutions (1-3)

1. Adoption and Implementation of Broader PIM framework. We recommend the Ministry of Economy to approve and implement PIM with clear requirements for:
   - Project Identification and Pre-screening based on robust generation and transmission subsector planning inputs from MTAI
   - Formal Project Pre-appraisal, Appraisal & Independent Review of Appraisal
   - Project Prioritization and Selection
   - Project Implementation and Adjustment
   - Facility Commissioning, Operation & Review and Evaluation

2. Elimination of Shortcomings in PPP Project Cycle. We recommend the Government to:
   - Establish a project development facility to serve as a one-stop project preparation fund for PPP projects
   - Carry out transparent and competitive procurement for PPPs
   - Carry out transparent and competitive procurement processes for PPPs consistent with the Law on PPPs
   - Roll out PPP template documents (e.g. PPAs for large projects, Government Support Agreements) under the PPP legal framework, while leaving flexibilities to adapt documents to specific future deal needs
   - Prepare a comprehensive capacity building program based on skill requirements across the PPP project cycle
   - Develop a framework for assessment of financial commitments and contingent liabilities under PPPs

3. Improve Predictability of Cash Flows. We recommend PSRC to consider:
   - Fixing O&M expenditures in the SOE tariff for a period of at least three years through cost-efficiency coefficient to be applied to those expenditures after each revision based on similar coefficients applied to well-performing utilities
   - Specifying and publicly disclosing the approach to computation and adjustment of return on assets for power sector SOEs
4. Improve Corporate Governance. Snapshot of key improvements required:

- **Strengthen Board of Directors**: (a) align the authority with good practices in design of strategy, determining performance objectives, monitoring financial and operational performance & decisions on management appointment; (b) appoint at least two independent Board Members; (c) establish Board Committees; (d) introduce qualification and experience requirements for existing or potential board members; and (d) introduce annual evaluation mechanism.

- **Introduce Performance Monitoring & Management**: (a) establish clear accountability lines between SOE Board of Directors and its Executive Management; (b) introduce regular performance monitoring mechanism; and (c) design SOE performance monitoring system for keeping SOE management accountable for results.

- **Strengthen Audit, Financial Transparency & Documentation**: (a) appointing Internal Auditors to oversee the SOE’s internal control system; and (b) publish full annual reports, corporate governance statements and other non-financial information.

- **Improve Corporate Documentation**: (a) expand the section on a board of directors, defining the number of board members and their appointment terms; (b) add core functions to the Board, such as strategy-setting, management appointment, monitoring responsibility for the Company’s performance (via KPIs) and efficient internal controls; (c) develop and adopt internal by-laws and regulations (e.g. regulation on the Board of Directors and its Committees, Regulation on Related Party Transactions, Conflict of Interest, Information Disclosure Policy).

5. Increase availability of capital from domestic and international capital markets

- Development of robust and adequately-sized (through aggregation) PPP pipeline would attract long-term financing from international lenders and local capital market (pension funds).

- Introduction of crowdfunding would enable small projects to access larger pool of long-term resources.

- Strengthen the capacity of local capital market in project finance.
**SYNOPSIS**

**Tariff Impacts and Benefits of Long-Term Commercial Financing of Power Sector SOEs**

- Commercial financing of HVEN and YTPC, including refinancing of existing debts, would raise the end-user tariff only by 2-3% vs “No Commercial Financing Scenario”
- Credit-enhancement has beneficial impact to achieve much-needed extension of maturity

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**Why Long-Term Commercial Financing of Power Sector SOE Investments and Refinancing of Existing Public Debt is Viable?**

- Public debt refinancing with foreign currency denominated commercial debts will smooth out the debt service requirements of power sector SOEs
- In the long-run, the end-user power tariff will rise by 2.2%-3.2% relative to the base case scenario of “no public debt refinancing”
- Refinancing of existing public borrowing of HVEN and YTPC can release at least $300 million for MOF to spend on other pressing needs
Power Sector Overview
POWER SECTOR OVERVIEW

Electricity Demand

• 1999-2019: 2.2% average annual growth of domestic electricity sales
• Demand growth driven by industrial, services, and residential sectors; average annual GDP growth of 6.4% in 2003-2019

1999-2002: Price elasticity effect due to improved billing
2008: Economic downturn due to global financial crisis
2018: Reduction in industrial and residential demand with economic growth driven by services with low energy intensity and trade intermediation (non-recurrent growth episode)

2003-2019:
➢ 150% growth in “other commercial” demand – primarily leisure and hospitality
➢ 89% growth in industrial demand
➢ 47% growth in residential demand driven by heating and air conditioning

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➢ 89% growth in industrial demand
➢ 47% growth in residential demand driven by heating and air conditioning
Diversified electricity supply mix with efforts underway to further expand the share of RE

### Existing Power Plants

<table>
<thead>
<tr>
<th>Type</th>
<th>Installed Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANPP</td>
<td>Nuclear 400 MW</td>
</tr>
<tr>
<td>Hrazdan TPP</td>
<td>Thermal (gas) 800 MW (400 MW operational)*</td>
</tr>
<tr>
<td>Hrazdan-5 TPP</td>
<td>Thermal (gas) 440 MW</td>
</tr>
<tr>
<td>YTPC CCGT</td>
<td>Thermal (gas) 242 MW</td>
</tr>
<tr>
<td>Sevan-Hrazdan Cascade/IEC</td>
<td>Hydro 560 MW</td>
</tr>
<tr>
<td>Vorotan Cascade/ContourGlobal</td>
<td>Hydro 404 MW</td>
</tr>
<tr>
<td>Small RE and cogeneration (&lt;30 MW)</td>
<td>Small hydro, wind, and solar 280 MW</td>
</tr>
</tbody>
</table>

### Under-Construction Power Plants

<table>
<thead>
<tr>
<th>Type</th>
<th>Installed Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yerevan CCGT-2/RENCO CCGT</td>
<td>Thermal 226 MW</td>
</tr>
<tr>
<td>SHPPs</td>
<td>Small hydro 382 MW</td>
</tr>
<tr>
<td>Masrik-1 Solar PV</td>
<td>Solar PV 55 MW</td>
</tr>
</tbody>
</table>

- Share of gas-fired thermal* reduced from 43% in 2012 to 37% in 2017
- Share of small RE** increased from 7% in 2012 to 13% in 2017
- Share of nuclear is relatively stable given it is a low-cost base-load power plant

* Share of thermal increased in 2018 and will be higher until 2023 because ANPP is off-line operating life extension project.
** Small RE = primarily small and micro hydro, small wind and solar.
1999-2019: Transmission losses reduced from 5% to 2%
1999-2019: Distribution technical losses reduced from 16% to 7%; commercial losses – from 11% to 0.1%
1999-2019: Collections increased from 67% to 100%

1999-2002: Price elasticity effect due to improved metering and billing after privatization
2008: Impacts of global financial crisis
2010: Expansion of the share of smart meters
2015-2016: Overhaul of commercial and metering departments after sale of ENA to Tashir Capital and Liormand Holdings
Operationally efficient and financially sustainable power sector ready to enter next phase of development

Phase 1: 1998-2006
- Unbundling of power sector into legally independent generation, transmission, dispatch, supply and distribution companies
- Involvement of private sector including privatization of power distribution and several generation companies
- Establishment of legal and regulatory framework including establishment of independent regulatory commission (PSRC), licensing rules and regulations, cost-recovery tariff methodology

Phase 2: 2007-2019
- Rehabilitation of critical power transmission and distribution assets
- Construction of new generation capacity and rehabilitation of existing
- Kick-starting development of renewable energy and energy efficiency
- Implementation of financial recovery program to improve sector financial sustainability

Phase 3: 2020-
- Gradual liberalization of the power market and introduce elements of competition
- Further improvement of operational efficiency and security, including digitization and cybersecurity, and financial strength of power sector SOEs
- Facilitating capital market access of power sector SOEs
- Further improvement of regulatory framework to improve long-term predictability of SOE revenues
Regulated and unbundled sector with legally independent generation, transmission, and distribution functions

**Sector Institutional Overview:**
- System operator is responsible for dispatch and supply security.
- Independent multi-sectoral regulator—Public Services Regulatory Commission (PSRC) is responsible for tariff setting, service quality and licensing.
- Ministry of Territorial Administration and Infrastructure is responsible for energy policy.
- Renewable Resources and Energy Efficiency Fund (R2E2 Fund) is responsible for promotion of investments into EE and RE.

**Significant Private Investments in the Power Sector:**
- Most of generation is privately owned except for Armenian Nuclear Power Plant (ANPP) and Yerevan Combined Cycle Gas Turbine (CCGT) Plant.
- Electricity generation company—Electric Networks of Armenia (ENA)—is privately-owned.
- Electricity transmission company—High Voltage Electric Networks (HVEN)—is state-owned.
Regulatory framework is ready for roll-out of new power market structure.
The Government has embarked on gradual liberalization of the power market to be rolled out by end-2021.

1. The objective of the new electricity market design is to introduce structure to allow for increased competition in the future.

2. Electricity market will have the following segments:
   - Bilateral market comprised of electricity long-term bilateral contracts, month ahead regulated bilateral contracts and non-regulated bilateral contracts.
   - Day ahead market.
   - System services and balancing mechanism market.
## POWER SECTOR OVERVIEW
### New Power Market Structure: Wholesale and Retail Market Participants

#### Wholesale

<table>
<thead>
<tr>
<th>Category</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER PRODUCERS</td>
<td>Regulated Power Producers (incl. RES generators)</td>
</tr>
<tr>
<td></td>
<td>Renewable Power Producers</td>
</tr>
<tr>
<td></td>
<td>Independent Power Producers</td>
</tr>
<tr>
<td></td>
<td>Merchant Power Producers</td>
</tr>
<tr>
<td>UNIVERSAL SUPPLIER</td>
<td>The new role of the universal supply granted by Law (until end of June 2025)</td>
</tr>
<tr>
<td></td>
<td>exclusively to ENA. ENA mainly providing distribution service</td>
</tr>
<tr>
<td>INDEPENDENT SUPPLIERS</td>
<td>Expected to be created initially for supplying large consumers that may not</td>
</tr>
<tr>
<td></td>
<td>consider direct participation in the Wholesale Market and all retail customers</td>
</tr>
<tr>
<td>TRADERS</td>
<td>Traders expected to be facilitators of the wholesale trade and activate cross</td>
</tr>
<tr>
<td></td>
<td>border trade</td>
</tr>
<tr>
<td>QUALIFIED CUSTOMERS</td>
<td>Direct access to the Wholesale Electricity Market</td>
</tr>
<tr>
<td></td>
<td>with a right to import electricity</td>
</tr>
</tbody>
</table>

#### Retail

<table>
<thead>
<tr>
<th>Category</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIVERSAL SUPPLIER</td>
<td>• Electricity Supply</td>
</tr>
<tr>
<td></td>
<td>• Electricity Sale/Purchase</td>
</tr>
<tr>
<td></td>
<td>At Regulated Tariffs</td>
</tr>
<tr>
<td>INDEPENDENT SUPPLIERS</td>
<td>• Electricity Supply</td>
</tr>
<tr>
<td></td>
<td>• Electricity Sale/Purchase</td>
</tr>
<tr>
<td></td>
<td>At Market Prices</td>
</tr>
<tr>
<td>AUTONOMOUS POWER PRODUCERS</td>
<td>• Generators under net metering rules</td>
</tr>
</tbody>
</table>

IPPs will continue selling to off-taker at contractually-agreed PPA tariffs.
POWER SECTOR OVERVIEW

New Power Market Structure: Market Service Providers

SYSTEM OPERATOR
• Planning & forecasting
• Scheduling & Dispatching
• Operational Management
• Interconnection Management

MARKET OPERATOR
• Operation and maintenance of MMS software
• Organization of Market Operation
• Registration of Orders and Transactions
• Metering & Settlement

TRANSMISSION OPERATOR
• Transmission Service (Asset Management)
• Electricity transit
• Operation of Metering Complex
• Transmission Network Rehabilitation and Extension

DISTRIBUTION OPERATOR
• Electricity Distribution
• Registration of Retail Metering data
• Distribution Network Rehabilitation and Extension

BALANCING SERVICE PROVIDER
• Balancing services
• Purchase & sale of electricity under Balancing Mechanism
### Significant private ownership in the sector: most of the electricity generation and the distribution are privately owned

<table>
<thead>
<tr>
<th>Companies</th>
<th>Type</th>
<th>Installed Capacity</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANPP</td>
<td>Nuclear</td>
<td>400 MW</td>
<td>100% SOE</td>
</tr>
<tr>
<td>Hrazdan TPP</td>
<td>Thermal</td>
<td>800 MW</td>
<td>100% private (Tashir Group)</td>
</tr>
<tr>
<td>Hrazdan-5 TPP</td>
<td>Thermal</td>
<td>440 MW</td>
<td>100% private (Gazprom)</td>
</tr>
<tr>
<td>YTPC CCGT</td>
<td>Thermal</td>
<td>242 MW</td>
<td>100% SOE</td>
</tr>
<tr>
<td>Sevan-Hrazdan Cascade/IEC</td>
<td>Hydro</td>
<td>560 MW</td>
<td>Tashir Capital (70%) and Liormand Holdings (30%)</td>
</tr>
<tr>
<td>Vorotan Cascade</td>
<td>Hydro</td>
<td>404 MW</td>
<td>100% private (Contour Global)</td>
</tr>
<tr>
<td>RENCO CCGT</td>
<td>Thermal</td>
<td>226 MW</td>
<td>100% Private (RENCO)</td>
</tr>
<tr>
<td>SHPPs</td>
<td>Small hydro</td>
<td>382 MW</td>
<td>100% private (various local investors)</td>
</tr>
<tr>
<td>Masrik-1 Solar PV</td>
<td>Solar PV</td>
<td>55 MW</td>
<td>100% private (FRV)</td>
</tr>
<tr>
<td>HVEN</td>
<td>Transmission</td>
<td></td>
<td>100% SOE</td>
</tr>
<tr>
<td>ENA</td>
<td>Distribution</td>
<td></td>
<td>100% private (Tashir Group)</td>
</tr>
<tr>
<td>Energoimpex</td>
<td>Trader</td>
<td></td>
<td>100% SOE</td>
</tr>
</tbody>
</table>

- 80% of existing generation capacity is privately owned
- 100% of generation capacity under development is privately owned
- Electricity distribution company is privately owned

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**POWER SECTOR OVERVIEW**

**Asset Ownership Structure**

- Existing generation
- Under various stages of development
Energy Sector Strategy 2040 is the key document specifying the strategic objectives and priorities for the next 20 years. The strategic vision/objectives include:

1. Competitive and non-discriminatory
2. Inclusive, diversified, and energy-independent
3. Clean, efficient, effective, and sustainable
4. Regionally interconnected
5. Reliable and safe
6. Digitized and innovative
7. Predictable and transparent
8. Accessible, affordable, and attractive to investors

The priorities are:

1. Maximum utilization of renewable potential
2. Improvement of energy efficiency
3. Life extension of ANPP Unit No. 2
4. Improvement of regional connectivity
5. Gradual liberalization of electricity market
Sector legal framework is conducive for reliable and efficiency operation of the sector, and attraction of investments

**Law on Energy**
- Establishment of government policies in the energy sector and mechanisms for their implementation
- Regulation of relationships among government bodies, energy sector legal entities, and energy consumers

**Law on Energy Efficiency (EE) and Renewable Energy (RE)**
- Establishment of principles for promoting EE and development of RE to: (a) improve the reliability and security of energy supply; (b) facilitate new production/technologies and services aimed at promoting EE and development of RE; and (c) reduce negative impacts on human health and the environment
- Regulation of relationships among government bodies, legal entities, and individuals involved in: (a) design, manufacturing, and import of energy equipment and materials related to EE and RE; (b) design, manufacturing, and import of equipment for determining the quality of EE and RE equipment; and (c) activities for design, innovation, research & development in the fields of EE and RE

**Law on Public Services Regulatory Body**
- Regulates the procedures for establishment and functioning of the body responsible for regulation of public services (electricity, gas, water, telecommunications)

**Law on Safe Utilization of Atomic Energy for Peaceful Purposes**
- Defines the legal basis and regulates the principles related to: (a) use of nuclear energy with the aim to protect human life, health, property, and the environment; (b) advancement of peaceful nuclear science and technical development; and (c) cooperation in strengthening of the international regime governing the safe utilization of nuclear energy
Sector regulatory framework is conducive for reliable and efficiency operation of the sector, and attraction of investments.

Clear licensing requirements
- Regulates generation, transmission, distribution and supply of electric energy
- 80 days for review of license request applications by authorized body for all activities subject to regulation with exception of small RE with review period of 25 days

Predictable and Robust Tariff Policy
- Cost-recovery tariff methodology allowing for recovery of economically justified costs
- Adequate track-record of tariff adjustment with pass-through of changes in costs
- End-user tariffs reflect the cost of supply to each category of consumers
- Tariffs are regularly rebalanced to avoid unjustified cross-subsidies (this does not include lifeline tariff for vulnerable consumers)

Clear market rules
- Wholesale and Retail Electricity Market Rules
- Wholesale and Retail Electricity Market Model Contracts
- Transmission Grid Code
- Distribution Grid Code

Transparency and stakeholder engagement
- High level of legal and regulatory transparency with key decision and other important info published by PSRC
- All key decisions are published for public feedback 30 days in advance of the decision meeting
- Key stakeholders are allowed to attend the PSRC meeting/discussion
- Tariff regulatory filings are public
Tariffs cover the cost of electricity service and have mostly been at cost-recovery levels since early 2000s. Lifeline tariff structure protects the vulnerable consumers.

Methodology Applies to:
- Large regulated generators
  - ANPP
  - YTPC
  - Hrazdan TPP
  - Hrazdan-5 TPP
  - IEC
  - ContourGlobal,
- Transmission company (HVEN)
- Distribution company (ENA)

At least annual adjustment of tariffs to pass through the changes in costs due to inflation and/or depreciation of FX.

End-user Tariffs Effective from Feb 1, 2021

<table>
<thead>
<tr>
<th>Category</th>
<th>Tariff (VAT incl), AMD/kWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>110 kV (day-time)</td>
<td>36.48</td>
</tr>
<tr>
<td>110 kV (night-time)</td>
<td>32.48</td>
</tr>
<tr>
<td>35 kV (day-time)</td>
<td>38.98</td>
</tr>
<tr>
<td>35 kV (night-time)</td>
<td>34.98</td>
</tr>
<tr>
<td>6 (10) kV (day-time)</td>
<td>44.98</td>
</tr>
<tr>
<td>6 (10) kV (night-time)</td>
<td>34.98</td>
</tr>
<tr>
<td>0.38 kV (day-time)</td>
<td>47.98</td>
</tr>
<tr>
<td>0.38 kV (night-time)</td>
<td>37.98</td>
</tr>
<tr>
<td>0.38 kV (day-time): monthly consumption &lt;400 kWh</td>
<td>44.98</td>
</tr>
<tr>
<td>0.38 kV (night-time): monthly consumption &lt;400 kWh</td>
<td>34.98</td>
</tr>
<tr>
<td>Consumers in PFBP with poverty score of &gt;20* (day-time):</td>
<td>29.99</td>
</tr>
<tr>
<td>Consumers in PFBP with poverty score of &gt;20 (night-time)</td>
<td>19.99</td>
</tr>
</tbody>
</table>

* Poverty Family Benefit Program
The impact of tariff increases for residential customers is mitigated through a preferential tariff, which is a cross-subsidy with other residential consumers paying a higher tariff.

<table>
<thead>
<tr>
<th>Category</th>
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- Residential consumers/households up with monthly consumption of up to 400 kWh pay 6.3% lower tariff. This threshold allows to reach all vulnerable consumers because the estimated mean consumption of households in first two quintiles is less than 140 kWh/month.
- Consumers involved in PFBP and having poverty score of >20 pay 37.5% lower tariff. Further assessments are required to determine what % of socially vulnerable consumers benefit from this preferential tariff.
The Law On PPP was adopted on June 28, 2019, on the basis of the PPP Policy of the Republic of Armenia, dated November 9, 2017. The Law defines the objectives of PPP, the rules and procedures of development and implementation of PPP programs, the institutional framework and the project selection criteria.

### Objectives
- Reduction of life-cycle costs and improvement of the quality of construction, operation and maintenance of public infrastructure
- Increased access to public infrastructure and services
- Use of private sector experience, resources, technologies and innovative capacities
- Increased public accountability and transparency
- Attraction of investments in new public infrastructure

### PPP project criteria
- Project life of more than 5 years
- Aimed at creation, improvement, operation and maintenance of public infrastructure
- Risk sharing between private and public partners
- Economic returns higher than the hurdle rate established by the PPP procedures (IRR>9%)
- Alignment with priorities of Public Investment Management Policy
- Fiscally affordable
- Positive value-for-money (VfM)

### Government support mechanisms
- Grants and subsidies
- Allocation of necessary assets for PPP projects
- Guarantees of minimum revenues or minimum number of customers with PPP program
- Guarantees purchase of a portion of goods and services produced by the PPP project
- Loans and other forms of financing/investment
- Compensation for certain risks and costs
- Fiscal guarantees

### Dispute Settlement
All disputes are settled in accordance with:
- PPP Agreement
- The mechanism set in the agreement on investment promotion and mutual protection ratified by the Republic of Armenia

Parties of the PPP Agreement are free to choose the dispute settlement mechanism, including:
- Adjudicator
- Legally binding or unbinding expert assessment or opinion
- Local or international commercial or investment arbitration
### POWER SECTOR OVERVIEW

#### Institutional Structure of PPPs

<table>
<thead>
<tr>
<th>Policy Making Authority (Ministry of Economy)</th>
<th>Authorized Body (Line Ministry)</th>
<th>PPP Division (Ministry of Economy)</th>
<th>PPP Authorized Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Develops PPP Policy</td>
<td>• Controls the implementation of financial obligations set by a PPP agreement</td>
<td>• Provides administrative, methodological, expert, advisory, technical and other support to PPP Authorized Body and Public Partners</td>
<td>• Drafts PPP projects</td>
</tr>
<tr>
<td>• Promotes PPP projects and attracts private investors/partners</td>
<td>• Monitors PPP projects from the point of view of contingent liabilities</td>
<td>• Organizes training and capacity building activities for Public Partners and PPP Authorized Body</td>
<td>• Presents draft decrees on preparation and modification of a PPP project and extension of PPP agreements</td>
</tr>
<tr>
<td>• Develops legal acts concerning the PPP procedures</td>
<td>• Analyzes PPP projects based on PPP selection criteria</td>
<td>• Provides an opinion on PPP projects</td>
<td>• Organizes tenders in accordance with selection procedures</td>
</tr>
<tr>
<td></td>
<td>• Provides an opinion on PPP projects</td>
<td></td>
<td>• Signs PPP agreement with the winning participant</td>
</tr>
</tbody>
</table>

Institutional framework is clear with specific division of responsibilities for PPP projects
## Renewable Energy Framework

The legal and regulatory framework is overall supportive for RE investments

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Streamlined licensing process</td>
</tr>
<tr>
<td></td>
<td>- One construction and operation license with clear requirements</td>
</tr>
<tr>
<td></td>
<td>- PSRC is required to respond within 25 days after submission</td>
</tr>
<tr>
<td></td>
<td>- All solar PV projects &lt;5 MW, all SHPPs and wind projects &lt;30 MW are licensed</td>
</tr>
<tr>
<td></td>
<td>- Solar PV &gt;5 MW and wind &gt;30 MW are licensed as per PPP framework</td>
</tr>
<tr>
<td>2</td>
<td>Clear grid connection requirements</td>
</tr>
<tr>
<td></td>
<td>- Interconnection to transmission network regulated by Transmission Grid Code</td>
</tr>
<tr>
<td></td>
<td>- Interconnection to distribution network regulated by Distribution Grid Code</td>
</tr>
<tr>
<td></td>
<td>- Net metering for PV for personal consumption</td>
</tr>
<tr>
<td>3</td>
<td>Feed-in tariffs and off-take for small RE</td>
</tr>
<tr>
<td></td>
<td>- Small HPP (&lt;30 MW): FiT of AMD24.4 or US$0.05/kWh*; Offtake of 15 years</td>
</tr>
<tr>
<td></td>
<td>- Distributed Small Solar (&lt;5 MW): FiT of AMD24.4/kWh; Offtake of 20 years</td>
</tr>
<tr>
<td></td>
<td>- Small Wind (&lt;30 MW): FiT of AMD24.4/kWh; Offtake of 20 years</td>
</tr>
<tr>
<td></td>
<td>- Solar with Net Metering (&lt;500 kW): Net metering regulation with sale of excess to the grid at roughly 50% of the regulated tariff for particular voltage level</td>
</tr>
<tr>
<td>4</td>
<td>Competitive procurement for utility-scale RE</td>
</tr>
<tr>
<td></td>
<td>- Competitive procurement for utility-scale RE</td>
</tr>
<tr>
<td></td>
<td>- Contractual framework regulated by the Law on Public Private Partnerships, Law on Renewable Energy, and PSRC regulations including template PPA</td>
</tr>
<tr>
<td></td>
<td>- Tested package of government support agreement is available (used in Yerevan CCGT-2/RENC0 and Masrik-1 Solar PV Projects)</td>
</tr>
</tbody>
</table>

*Converted using the following 2020 average annual exchange rate: US$1 = AMD489*
Share of RE in supply mix has been expanding since 2010 and several new projects are at various stages of development.

Small RE generation increased from 6% of total in 2010 to 11% of total in 2020.

- Small RE is defined as <30 MW
- No new large RE projects were constructed

Development of utility-scale non-hydro privately developed RE is accelerating.

### Installed Capacities of Small RE Projects

<table>
<thead>
<tr>
<th>Projects</th>
<th>2010</th>
<th>2020</th>
<th>New projects to be commissioned by end-2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHPP</td>
<td>106 MW</td>
<td>382 MW</td>
<td>35 MW</td>
</tr>
<tr>
<td>Distributed Commercial PV</td>
<td>-</td>
<td>-</td>
<td>115 MW</td>
</tr>
<tr>
<td>PV with Net Metering</td>
<td>-</td>
<td>85 MW</td>
<td>15 MW</td>
</tr>
<tr>
<td>Total</td>
<td>106 MW</td>
<td>467 MW</td>
<td>165 MW</td>
</tr>
</tbody>
</table>

Small RE capacity to reach 632 MW in 2023.

<table>
<thead>
<tr>
<th>Projects</th>
<th>Sponsor</th>
<th>Financiers</th>
</tr>
</thead>
<tbody>
<tr>
<td>55 MW Masrik-1 Solar PV: financial close reached</td>
<td>Sponsor: FRV (Netherlands)</td>
<td>FRV, IFC, EBRD and Ameriabank</td>
</tr>
<tr>
<td>200 MW Ayg-1 PV: in procurement stage</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>100 MW Solar PV: feasibility study underway</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
COVID-19 did not impact financial or operational performance of the power sector

Key Reasons Behind Robust Power Sector Performance during COVID-19:
- Robust electricity tariff setting methodology with full pass-through of economically justified costs to end-user tariffs
- At lease annual tariff adjustments to reflect changes in the cost of supply
- Tariffs at cost-recovery levels
- No public finance impacts from IPPs given no excess energy or supply capacity
- Adequate operational efficiency
- No deterioration in the reliability of electricity supply

<table>
<thead>
<tr>
<th>Key Indicators</th>
<th>2019 (pre-COVID)</th>
<th>2020 (COVID year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic electricity demand</td>
<td>5,802 GWh</td>
<td>5,810 GWh</td>
</tr>
<tr>
<td>Total electricity generation</td>
<td>7,632 GWh</td>
<td>7,723 GWh</td>
</tr>
<tr>
<td>Average collection rate for electricity</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Payment discipline to IPPs</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Sector investments</td>
<td>No deferral of investments due to COVID</td>
<td></td>
</tr>
<tr>
<td>Reliability of electricity supply (SAIFI)</td>
<td>7.94</td>
<td>7.33</td>
</tr>
</tbody>
</table>
Power Sector Investment Needs
Electricity Demand Growth Rate = Real Per Capita GDP Growth x Income Elasticity of Demand (0.7) + Annual Electricity Price Increase x Price Elasticity of Demand (-0.2)

Growth of real GDP would increase electricity demand, while electricity tariff increases would reduce the demand

   - High Case GDP growth rate - 6%
   - Base Case GDP growth rate – 4%
   - Low Case GDP growth rate - 3%.

b. 2.4% annual increase of electricity price is the growth rate required to reach the long-run average incremental cost of electricity supply (LRAIC) by 2035. LRAIC was estimated based on the supply scenario with the lowest evaluated present value of economic cost.

c. Electricity transmission losses were assumed to remain at 2% of net outflow from transmission network.

d. Electricity distribution losses were assumed to reduce from 9.45% of net demand in 2018 to 6.84% by 2029 due to large investment program (around $425 million) of ENA for 2020-2027.

e. Power plant own use was assumed to reduce from 5.1% in 2018 to 3.1% after decommissioning of ANPP and old thermal plants.
The need for new generation capacity was assessed to:

1. Meet the projected 2% increase (base case) of average annual electricity demand.
2. Reduce overall cost of supply if new lower-cost generation options are available.
3. Fill in the supply gap after decommissioning of:
   - ANPP: It is estimated to reach the end of its useful operating life currently schedule for 2026.
   - Hrazdan TPP: This plant has been commissioned in 1965-1970 without any major capital upgrade since then. Out of 800 MW of installed capacity, only 400 MW is operational. The plant has the highest operating cost in the system due to low heat rate consuming 2 times more gas compared to modern CCGTs. Expected to be decommissioned once new 226 MW RENCO CCGT is commissioned by end-2021.
### Identification of the potential generation technologies

Only technically feasible generation technologies were considered. The following key data was used related to each generation technology: (a) capital costs based on recent completed projects; (b) standardized capacities available on the market; (c) technical specifications for each technology as per manufacturers’ data, including minimum load and ramp-up/ramp-down constraints; and (d) adjustments to efficiency for thermal units considering the elevation of locations in Armenia.

### Minimization of the total supply cost

The total supply cost included the capital costs, fuel costs, non-fuel variable and fixed operation and maintenance (O&M) costs, and import tariffs. The minimization of the total supply cost was carried out subject to: (a) the technical constraints of existing and new potential power generation technologies; and (b) cost of unserved energy.

### Validation of results

The hourly dispatch simulation was conducted to confirm whether the evaluated LCP or other expansion plans are feasible, i.e., meet the projected electricity demand subject to constraints.

### Grid integration study

Power flow and transient stability analyses was conducted to determine whether the proposed combination of projects be able to normally operate in the power system and whether disturbances caused by its variability can be absorbed by the system.

---

**POWER SECTOR INVESTMENT NEEDS**

**Estimating Need For New Generation Capacity**

**Generally-accepted least-cost planning approach was used to assess the need for new generation investments**

1. **Identification of the potential generation technologies**
   - Only technically feasible generation technologies were considered. The following key data was used related to each generation technology: (a) capital costs based on recent completed projects; (b) standardized capacities available on the market; (c) technical specifications for each technology as per manufacturers’ data, including minimum load and ramp-up/ramp-down constraints; and (d) adjustments to efficiency for thermal units considering the elevation of locations in Armenia.

2. **Evaluation of LCP assuming unconstrained electricity demand**
   - For the first iteration of LCP, electricity demand was assumed to be dependent only on real GDP growth rate. The energy price increase trajectory was derived using two-step process: (a) estimated LCP was used to compute the long-run average incremental cost of supply (LRAIC); and (b) current average tariff was assumed to increase to the level of LRAIC by 2035 to generate sufficient revenue to finance those investments.

3. **Minimization of the total supply cost**
   - The total supply cost included the capital costs, fuel costs, non-fuel variable and fixed operation and maintenance (O&M) costs, and import tariffs. The minimization of the total supply cost was carried out subject to: (a) the technical constraints of existing and new potential power generation technologies; and (b) cost of unserved energy.

4. **Electricity demand update**
   - The electricity demand was updated to include the impact of energy price increase to the level of LRAIC and the updated demand was used for second iteration of LCP to right-size the new electricity generation capacity.

5. **Validation of results**
   - The hourly dispatch simulation was conducted to confirm whether the evaluated LCP or other expansion plans are feasible, i.e., meet the projected electricity demand subject to constraints.

6. **Grid integration study**
   - Power flow and transient stability analyses was conducted to determine whether the proposed combination of projects be able to normally operate in the power system and whether disturbances caused by its variability can be absorbed by the system.
Gradual commissioning of 1,050 MW of new Solar PV capacity in 2021 – 2035 with total capex of $750 million

Existing thermal power plants and RENCO CCGT (under construction) in combination with Solar PV can substitute the ANPP

US$1.5 billion of new financing would be required in 2021-2035 for construction* of solar PV and wind projects

Energy Strategy also includes:
- 500 MW of wind capacity, which is not part of LCP, but is planned from supply diversification and energy security perspective
- At least 600 MW new nucellar power plant (NPP), which was not included into this Study given unclarity about its justification. However, if pursued, it would require at least US$3.5 billion in new investments in addition to US$1.5 billion for solar PV and wind

- Increase in the share of thermal generation is due to increased reliance on existing thermal power plants to meet daily and seasonal peak demand after ANPP is retired
- The Government should update LCP in 2022 given rapid ongoing change in cost of Solar, Wind, and BESS, which may make Solar PV + +Wind + BESS economically competitive

*Does not include at least US$200 million of ANPP decommissioning costs and financing costs
During winter peaks, ANPP would be replaced by thermal and Solar PV with thermal accounting for a larger share given low solar irradiation in winter.

During summer peaks, ANPP would be replaced by Solar PV and thermal with Solar PV accounting for the larger share given high solar irradiation in summer.

* Winter peak load in 2017: Jan. 24
** Summer peak load in 2017: Aug. 8
1. **Abundant financing.** Availability of significant concessional and commercial resources to finance the project.

2. **Short lead time:** New solar PV capacity can be commissioned in 18-24 months after financial close of the transaction with private developer, including the time required for competitive selection of project sponsors.

3. **Construction of new capacity in small increments.** The capacity can be constructed in small increments (e.g. 100 MW) parallel to the growth in demand.

4. **Other benefits:**
   - Local job creation in green technologies (local assembly and, potentially, higher value-adding segments of PV value chain)
   - Introduction of modern PV technologies with positive knowledge spillovers to local energy sector (on-job-training and specialized education).
   - No operational risk for the government compared to thermal projects (supply of fuel and water).
POWER SECTOR INVESTMENT NEEDS
What New Transmission Network Investments are Needed For?

HVEN would require additional US$230 million in 2021-2035 for further strengthening of transmission network

Rehabilitation of four substations

- Rehabilitation of 220/110/10 kV Shahumyan-2 substation
- Rehabilitation of 220/110/10 kV Marash substation
- Rehabilitation of 220/110/35 kV Yeghegnadzor substation

Total capital cost of US$60 million

Participation in Georgia-Armenia Interconnection Project

- Preliminary analysis suggests that Armenia would benefit from participation in this power and digital interconnection project
- Armenia’s share in total project benefits is estimated at 4% of the total benefits over 2030-2040

Total capital cost of US$100 million assuming it is proportionate to Armenia’s share of project benefits

Strengthening of network to integrate 1,050 MW of solar PV

- 387 km of new lines and 3 supply transformers would be needed
- The total capital cost is estimated at US$70 million
- Bulk of investments needed by 2025 due to expected solar build-up

Year | 2025 | 2030 | 2035
--- | --- | --- | ---
Transmission Capital Costs (million US$) | 60 | 68 | 70
Solar Installed Capacity (MW) | 717 | 1,000 | 1,050
ENA plans to invest US$445 million in 2021-2027 to further improve electricity supply reliability at distribution level as part of US$727 million Investment Program for 2017-2027.

Main Targets of ENA’s Investment Program 2017-2027:
- Reduction in number and duration of end-user planned and unplanned outages due to distribution network issues
- Reduction of reported cases of voltage fluctuations
- Connection of new customers
- Reduction of technical loses and minimization of commercial losses
- Further improvement of metering infrastructure
- Further improvement of cost effectiveness
- Update of Management Information Systems (MIS) and continued adoption of ISO standards
Financing of Power Sector Investments to Date
In 2007-2019, US$2.5 billion of power sector investments were financed by international & local private sector and public borrowing.

US$1.72 billion of private debt and equity for:
- Upgrade and rehabilitation of distribution network
- Construction of Gazprom’s Hrazdan-5 TPP
- Upgrade and rehabilitation of Sevan-Hrazdan Cascade
- Construction of privately-owned and operated small RE (primarily SHPPs)

US$750 million of sovereign-guaranteed debt for:
- Rehabilitation of critical power transmission lines and substations
- Rehabilitation of Vorotan Cascade
- Construction of Yerevan CCGT
- Kick-starting development of small RE
The Government has been increasingly reliant on private financing for new utility-scale generation investments using long-term PPAs and Government Support Agreements (GSA).

### 2007-2010: Yerevan CCGT Project (public)
- **Size:** 240 MW
- **Cost:** US$247M
- **Financing:** JICA concessional credit
- **PPA:** None
- **Sovereign Guarantees:** Public debt on-lent to YTPC

### 2009-2013: Hrazdan-5 TPP (private)
- **Size:** 440 MW
- **Cost:** US$465M
- **Financing:** ArmGazProm balance sheet
- **PPA:** None
- **Sovereign Guarantees:** None

### Under-construction: Yerevan CCGT-2 Project (private)
- **Size:** 250 MW
- **Cost:** US$272 million
- **Sponsors:** Renco Spa (Italy), Siemens Project Ventures (Germany), and Simest Spa (Italy)
- **Equity:** US$68M
- **Debt:** US$204M; IFC - US$65M; Syndicated Loan – US$139M (ADB, OFID; and DEG)
- **PPA:** 20 years, with ENA
- **Government support/undertaking:** GSA
- **Other:** US$39 million MIGA non-commercial risk guarantee

### Under-construction: Masrik-1 Solar PV (private)
- **Size:** 55 MW
- **Cost:** US$49.3 million (excluding VAT)
- **Sponsors:** FRV Masrik (Spain)
- **Equity:** US$12.5M
- **Debt:** US$36.8M
  - IFC - US$17M
  - EBRD - US$17M (+2.9M EU grant)
- **PPA:** 20 years, with ENA
- **Government support/undertaking:** GSA

### GSA risk coverage:
- Legal, Force-Majeure leading to termination
- FX conversion
- Profit repatriation
- Off-taker default
- Transmission line land acquisition
- Gas supply

**Government obligations under GSAs are contingent liabilities and are not added to public debt.**
In 2007-2020, about US$650 million was provided by local and international private sector for small RE projects without any sovereign guarantees.

- 189 SHPP projects with total installed capacity of 382 MW* were commissioned with financing primarily from local private sector with financing from local commercial banks.
- 15 distributed solar PV projects in operation and 47 under construction with combined installed capacity of 210 MW*.

Main Factors Enabling Private Financing of Small RE

1. **Clear and streamlined legislative requirements.** Clear and transparent requirements for construction and operation of small RE.
2. **Predictable FiT regime.** The FiT regime with off-take obligation and annual adjustment of tariff for changes in EUR/ADM exchange rate and inflation, creates predictable cash flows.
3. **Creditworthy offtaker.** ENA – the private power distribution company – had overall been in adequate financial standing with exception of 2014-2015 due to regulatory shortcoming, which was quickly fixed by PSRC.
4. **Availability of financing from local commercial banks.** Local commercial banks have been providing US$ and EUR denominated loans for small RE projects with maturities of 4-5 years and interest rates of 6-9% with project assets used as collateral. Those maturities have been sufficient for the developers to complete construction of the project (1-2 years) and service or refinance the debt.

*Source: PSRC, as of Dec 31, 2020*
In 2007-2019, HVEN invested US$260 million* in rehabilitation, upgrade, and expansion of power transmission network

**Approach to Financing of Transmission Assets**

1. **Reliance on public debt.** All major electricity transmission projects (completed and ongoing) were financed by public debt provided by IFIs and bilateral development agencies to the Republic of Armenia.

2. **Ministry of Finance (MOF) made the resources available to HVEN.** The concessional resources from IFIs were on-lent by MOF to HVEN for specific investment projects.

3. **Debt service was included in HVEN’s tariff.** Debt service costs were included in HVEN’s tariff as per debt amortization schedules in respective financing agreements and expected interest payments.

- HVEN rehabilitated 12 out of 15 high-voltage substations.
- HVEN rehabilitated 270 km or 100% of 110 and 220 kV lines requiring rehabilitation.
- HVEN is currently constructing new 400 kV lines to Iran and Georgia.

### Table: Financing of Transmission Projects

<table>
<thead>
<tr>
<th>No</th>
<th>Name</th>
<th>Face Value</th>
<th>Date*</th>
<th>Interest</th>
<th>Maturity</th>
<th>Grace</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IDA Credit: ETDP</td>
<td>$11,600,000</td>
<td>1/11/1998</td>
<td>0.5%</td>
<td>35</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>KfW Credit: PTRP</td>
<td>€14,060,000</td>
<td>30/7/1998</td>
<td>0.75%</td>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>KfW Loan: Gyumri-2</td>
<td>€7,300,000</td>
<td>30/1/2009</td>
<td>2.76%</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>KfW Credit: Gyumri-2</td>
<td>€7,300,000</td>
<td>30/7/2009</td>
<td>0.75%</td>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>IBRD Loan: ESRP</td>
<td>$35,500,000</td>
<td>1/6/2011</td>
<td>6-m Libor + IBRD variable spread</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>ADB Loan: PTRP</td>
<td>SDR24,022,000</td>
<td>5/9/2014</td>
<td>3.14%</td>
<td>25</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>IBRD Loan: AF to ESRP</td>
<td>$36,000,000</td>
<td>6/8/2014</td>
<td>6-m Libor + IBRD variable spread</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>KfW Loan: CTNP I</td>
<td>€75,000,000</td>
<td>9/12/2014</td>
<td>1.85%</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>KfW Loan: CTNP</td>
<td>€10,200,000</td>
<td>11/12/2014</td>
<td>0.75%</td>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>EIB Loan: CNTP I</td>
<td>€10,000,000</td>
<td>11/12/2014</td>
<td>1.5%</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>IBRD Loan: ETNIP</td>
<td>$23,140,000</td>
<td>8/4/2015</td>
<td>6-m Libor + IBRD variable spread</td>
<td>25</td>
<td>14.5</td>
</tr>
<tr>
<td>12</td>
<td>KfW Loan: CTNP III</td>
<td>€83,000,000</td>
<td>11/12/2015</td>
<td>1.80%</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>13</td>
<td>EDBI Loan: Iran 400 kV Iran</td>
<td>€83,083,000</td>
<td>2016</td>
<td>4%</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>Sunir FZE Loan: Iran 400 kV line</td>
<td>€24,817,000</td>
<td>2017</td>
<td>3%</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

*Based on actual disbursements as of Dec 31, 2019
In 2007-2020, ENA invested US$530 million in power distribution network with reliance on commercial credits and plans to invest additional $390 million* in 2021-2027

Approach to Financing of Transmission Assets

1. **ENA successfully raised commercial financing, with attractive terms, for its investment needs.** ENA has raised commercial financing for its investment needs using its own large balance sheet and even larger balance sheets of its parent companies, during various periods of time (2002 - Midland Resources Holdings (UK); 2005 – InterRAO (Russia); 2015 – Tashir Capital (70%) and Liormand Holdings (30%)

2. **Debt was attracted from various sources.** The debt was raised from following main sources: (a) local and international commercial banks; (b) parent companies of ENA in form of subordinated loans; and (c) and private arms of IFIs (EBRD, PSOD, IFC)

3. **Debt has been serviced through tariff revenues.** ENA mostly had cost-recovery tariffs allowing for 15% pre-tax return on regulated asset base (RAB). This return combined with depreciation recovered through the tariff allowed to service the commercial debt

### Main Loans**

<table>
<thead>
<tr>
<th>No</th>
<th>Main Loans**</th>
<th>Face Value</th>
<th>Interest</th>
<th>Maturity</th>
<th>Grace</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Unsecured bank loans</td>
<td>$7,012,658</td>
<td>5.5%</td>
<td>On demand</td>
<td>No info</td>
</tr>
<tr>
<td>2</td>
<td>Unsecured bank loans</td>
<td>AMD1,611,208,000</td>
<td>10%</td>
<td>On demand</td>
<td>No info</td>
</tr>
<tr>
<td>3</td>
<td>Secured bank loans</td>
<td>€15,716,904</td>
<td>Euribor +3%</td>
<td>On demand</td>
<td>No info</td>
</tr>
<tr>
<td>4</td>
<td>Secured loans from the Government</td>
<td>JPY1,758,682,232</td>
<td>1.8%</td>
<td>2029</td>
<td>No info</td>
</tr>
<tr>
<td>5</td>
<td>Secured loans from the Government</td>
<td>JPY140,560,592</td>
<td>1.8%</td>
<td>2039</td>
<td>No info</td>
</tr>
<tr>
<td>6</td>
<td>Secured loans from IFIs</td>
<td>$40,244,442</td>
<td>Libor +3.95%</td>
<td>2024</td>
<td>No info</td>
</tr>
<tr>
<td>7</td>
<td>Secured loans from IFIs</td>
<td>$40,234,690</td>
<td>Libor +3.95%</td>
<td>2024</td>
<td>No info</td>
</tr>
<tr>
<td>8</td>
<td>Secured loans from IFIs</td>
<td>€13,674,550</td>
<td>Euribor +3.95%</td>
<td>2026</td>
<td>No info</td>
</tr>
<tr>
<td>9</td>
<td>Secured loans from IFIs</td>
<td>€13,474,281</td>
<td>Euribor +3.95%</td>
<td>2026</td>
<td>No info</td>
</tr>
<tr>
<td>10</td>
<td>Secured credit line from IFI</td>
<td>€17,102,515</td>
<td>Euribor +2.75%</td>
<td>2021</td>
<td>No info</td>
</tr>
</tbody>
</table>

* Assuming following average annual exchange rate for 2021-2027: $1=AMD520

** Based on ENA Audit Report of 2019 Annual Financial Statements

In 2020, IFC provided $60 million to ENA for financing of 2020-2021 capital expenditure program
Financing of New Investments
**Can New Power Generation and Transmission Investments be Financed with Public Debt?**

**New investments would need to be increasingly financed with private capital considering public debt constraints**

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>2019</th>
<th>2020 e</th>
<th>2021 f</th>
<th>2022 f</th>
<th>2023 f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real GDP growth, at constant market prices</td>
<td>5.2</td>
<td>7.6</td>
<td>-7.6</td>
<td>3.4</td>
<td>4.3</td>
<td>5.3</td>
</tr>
<tr>
<td>Private Consumption</td>
<td>4.9</td>
<td>11.7</td>
<td>-14.0</td>
<td>4.9</td>
<td>4.1</td>
<td>5.0</td>
</tr>
<tr>
<td>Government Consumption</td>
<td>-3.0</td>
<td>12.5</td>
<td>15.6</td>
<td>-0.6</td>
<td>1.1</td>
<td>2.4</td>
</tr>
<tr>
<td>Gross Fixed Capital Investment</td>
<td>4.8</td>
<td>4.4</td>
<td>-8.6</td>
<td>2.3</td>
<td>5.2</td>
<td>5.4</td>
</tr>
<tr>
<td>Exports, Goods and Services</td>
<td>5.0</td>
<td>16.0</td>
<td>-31.4</td>
<td>8.7</td>
<td>12.2</td>
<td>12.6</td>
</tr>
<tr>
<td>Imports, Goods and Services</td>
<td>13.3</td>
<td>12.0</td>
<td>-32.1</td>
<td>8.3</td>
<td>9.2</td>
<td>9.7</td>
</tr>
</tbody>
</table>

**Medium-Term Economic Outlook is not Conducive to Public or Public-Guaranteed Financing of New Investments**

- Real GDP reduced by 7.6% in 2020 and may not recover to pre-COVID level until 2023
- Private investments will likely remain modest reflecting weak investor confidence
- High post-conflict spending and public investments will likely keep the fiscal deficit elevated and increase the Public Debt-to-GDP ratio from 53.5% in 2019 to over 70% in 2021

**Limited availability of public resources for financing of power sector investments given large social and other spending needs**

*Based on ENA Audit Report of 2019 Annual Financial Statements*
New large generation projects would continue relying on project finance approach to raise commercial financing

- Public financing is not realistic given public borrowing constraints and substantial competing resource needs in other sectors of economy
- Armenia has track record of financing such large investment projects with successful Yerevan CCGT-2/RENSC and Masrik-1 Solar PV IPP projects reaching financial close
- The new power market framework allows for integration of IPPs with full pass-through of supply costs to end-user tariffs

However, development of new IPP projects would need to incorporate lessons learned from previous projects:
- Robust framework for identification and prioritization of PPP projects is critical for timely development of requirement infrastructure operations, including project preparation facility that Government should consider establishing
- Competitive and international procurement process can yield significant benefits in form of lower tariffs and improve credibility of PPP pipeline for energy and other infrastructure sectors
- Model legal documents for PPPs are important to ensure consistent and balance risk allocation between the Government and the private sponsors, reducing transaction costs, and creating predictability for private developers

New small generation projects would continue relying on existing framework based on FiT

- The existing regulator framework has proven its effectiveness in attracting private financing into small RE Projects with predictable FiT, licensing, model PPA, etc.
New transmission and generation rehabilitation projects would need to raise capital through corporate financing

**How Will New Transmission Investments be Financed?**

**New transmission and generation rehabilitation projects would need to raise capital through corporate financing**

HVEN and YTPC would need to start using corporate financing to raise long-term commercial debt for their new investments as well as refinancing of existing investments given pressure on public debt pressure:

- Public financing is not realistic given public borrowing constraints and substantial competing resource needs in other sectors of economy
- Refinancing of entire or portion of existing sovereign guaranteed debt stock would generate additional

**HVEN and YTPC can rely on corporate financing because:**

- It has an overall satisfactory track record of operational and financial performance and predictable cash flows through tariff
- Planned further improvements of power tariff setting methodology would allow to fix O&M expenses for up to 5 years with further improvement of predictability of cash flows from commercial lenders’ perspective

**The following measures should be prioritized to enable HVEN and YTPC to start accessing capital markets:**

- Improvement of corporate governance to align with internationally-accepted practices & ISO standards on operations, quality management, environmental systems, cyber security
- Further improve tariff-setting framework to enhance predictability of tariff-based cash flows
- Hire financial and legal advisors to apply for credit rating and carry out preparatory work to attract long-term debt and/or bond issuance
Constraints to Raising of Additional Capital
**Constraints to Private Capital in Generation and Transmission Projects**

**Generation**
New investments in large generation will continue to rely on project finance; investments in rehabilitation/upgrade of existing assets will need to use corporate finance.

**Transmission**
New transmission projects, rehabilitation/upgrade of existing assets, and refinancing of existing debts will need to rely on corporate finance, which would require removal of key bottlenecks.

**Main Impediments**

1. Absence of a framework for prioritization of public investments

2. Inefficiencies in development of PPPs

3. Shortcomings in corporate governance of power SOEs

4. Improving predictability of SOE revenues from regulated tariffs

5. Limited availability of long-term financing
The Government has Energy Sector Strategy 2040, which defines the strategic priorities of the energy sector and identifies new power sector projects that need to be implemented following the principles of generation planning, but the Government does not have a PIM which impacts decision-making on prioritization of all public projects and development of PPP pipeline:

- Stipulates institutional responsibilities for preparation, quality control, and review of project proposals
- Defines economic, financial, E&S, technical feasibility, and other criteria for prioritization of public investment projects
- Specifies the requirements for early-stage technical and other preparatory work that is required for capital projects
- Provides framework for evaluation of project risks
- Requires design of risk mitigation and management techniques
- Define project implementation and handover arrangements
- Design project management and monitoring framework
- Specifies the procedure for prioritization of projects
Inefficiencies in PPP project cycle from identification to financial close of project finance transactions

1. **Pipeline development bottlenecks:** The Government of Armenia lacks detailed national development or sector planning to prioritize investments, ensure efficient use of public and private financing sources, carry out required preparatory work for projects to make them PPP-ready, and to identify potential PPP projects in a coherent and systematized manner.

2. **Prevalence of unsolicited proposals:** The majority of Armenia’s PPP experience has come through unsolicited proposals (USPs), initiated via MoUs signed between the Government of Armenia and prospective project developers. The prevalence of USPs is linked to the lack of national development or sector planning, which led private developers to fill the project void. In addition, USPs have been developed in the absence of any template or guidance standardizing required contractual contents and procedures.

3. **Absence of model contractual documents:** Majority of existing PPPs were procured using contractual documents customized for each project. There are no model Prequalification documents, PPAs (except for small RE projects), or Government Support Agreements for PPP projects in the power sector and in infrastructure overall. This leads to: (a) long lead times project financial close given that documents are adjusted based on various requests from sponsors and financiers; (b) higher transaction costs; and (c) unpredictability for project participants.
1. **Capacity constraints:** In the World Bank’s 2018 Procuring Infrastructure Public-Private Partnerships report, which analyzed Armenia’s PPP capacity prior to the enactment of the PPP Law, Armenia received low scores on metrics related to PPP project preparation, PPP contract management and unsolicited proposal. Despite the subsequent enactment of the PPP Law in 2019, capacity issues remain, and strong political commitment is required to ensure the law’s effective implementation.

2. **Lack of PPP-suitable projects:** Armenia is a relatively small PPP market and has a history of privatizing major infrastructure assets. As a result, there is limited low-hanging fruit in its current infrastructure project pipeline. It may therefore be sensible for Armenia to focus future pipeline development efforts on brownfield, small-scale, and/or O&M projects, where the benefits of PPPs lie more in private sector efficiencies rather than in financing or commercial operations, particularly given the continuing availability of IFI financing.
As part of this study, Corporate Governance (CG) Review of SOEs (HVEN and YTPC) was conducted to:

- Take stock of the existing corporate governance and financial accountability mechanisms at High Voltage Electric Networks of Armenia (HVEN) and Yerevan Thermal Power Center (YTPC)
- Offer recommendations to improve corporate governance based on internationally recognized standards, guidelines, and practices

While state participation is necessary in order to provide essential services and combat market failures, increased private participation in certain sectors has been proven successful in increasing value for money for consumers.

As part of this study, Corporate Governance (CG) Review of SOEs (HVEN and YTPC) was conducted to:

- Take stock of the existing corporate governance and financial accountability mechanisms at High Voltage Electric Networks of Armenia (HVEN) and Yerevan Thermal Power Center (YTPC)
- Offer recommendations to improve corporate governance based on internationally recognized standards, guidelines, and practices

Well-governed SOEs can raise private financing from local and international markets.
Power sector SOEs are not compliant with the current CG Code and the international good practices, which impacts availability of corporate finance.

**Board of Directors**

- Board of Directors is not empowered by corporate documentation to properly exercise their functions and act as effective governance body.
- HVEN Board of Directors does not have independent board members.
- Board of Directors does not have clear division of responsibilities.
- Board of Directors does not have specialized committees for effective and specialized oversight of technical matters.
- Board of Directors can be strengthened to have balanced skills set and industry background, while considering diversity aspects.
- Board of Directors’ compensation should be clearly formulated and free of undue influence.
- Board of Directors is not regularly evaluated.
- Lack of awareness about the Board members’ duties and as benefits of how properly functioning board can bring value to SOE.

**Performance Monitoring & Management Incentives**

- SOE management is not accountable to the Board of Directors for implementing the strategy, and adhering to the set operational and financial targets.
- Absence of linkage of SOE strategy and objectives with performance indicators and targets.
- SOE management remuneration is not linked to SOE performance and achievement of objectives.
Power sector SOEs require overhaul of corporate documentation and improvement of transparency

**Corporate Documentation**
- Board of Directors require proper delegation of authority to carry its functions effectively
- SOE’s corporate documentation requires revision to reflect targeted CG improvements
- SOE Charter requires update
- Other Documents
- Code of Ethics needs to be introduced

**Financial Reporting, Audit & Disclosure**
- HVEN has no Internal Audit function
- No Corporate Governance Statement
- SOEs do not publish their annual reports and corporate governance statements at the company website
During various time periods, the tariffs for power sector SOEs did not include ROA as allowed under the Tariff Methodology.

Absence of ROA was due to lack of self-financed investments by SOEs.

Current tariff (effective from Dec 2021) includes 12% pre-tax (10% post-tax) ROA for all power sector SOEs.

ROA does not always reflect the market cost of capital.
Interest from international capital markets to local energy projects is modest given relatively small size of projects and lack of pipeline.

1. **Corporate finance.** Large international lenders, primarily Russian commercial banks, have experience in lending to large industrial, energy, and mining projects in Armenia using corporate financing approach.
   - US$340 million loan from VTB (Russia) to Vallex Group and US$62 million from Danish pension fund. The project was suspended in 2018
   - €55 million from HSBC to ENA for its long-term Investment Program

2. **Project finance.** It is primarily IFI and DFI market including three projects reached financial close for hydro, CCGT and solar IPPs. The relatively small size of the market and project are main reasons for limited interest from international lenders.

3. **Pipeline of infrastructure PPPs.** Lack of robust multi-year pipeline of PPPs in infrastructure limits interest from international developers and lenders given the high market entrance costs relative to small future deal flow.
CONTRAINTS TO RAISING OF ADDITIONAL CAPITAL

Limited Availability of Long-Term Financing: Local Capital Markets (1)

Local banks have limited involvement in infrastructure finance

Key Reasons:
- High cost of funds and lending rates
- Lack of long-term funding to match the tenor of project finance debt
- Relatively small size of individual domestic banks and large size of required infrastructure loans
- Absence of a local syndicated loan market
- Lack of familiarity with project and structured finance
- Credit methodologies emphasizing past financial results and availability of collateral rather than future cash flows

<table>
<thead>
<tr>
<th>Corporate entity</th>
<th>Ownership</th>
<th>International lenders’ rates</th>
<th>Local bank lending rates on &gt;5-Y loans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Networks of Armenia (ENA)</td>
<td>Private</td>
<td>Base rate + 2.75% - 3.95%</td>
<td>8-10% in USD</td>
</tr>
<tr>
<td>High Voltage Electric Networks of Armenia (HVEN)</td>
<td>State-owned</td>
<td>-</td>
<td>6-7% in EUR</td>
</tr>
<tr>
<td>Yerevan Thermal Power Center (YTPC)</td>
<td>State-owned</td>
<td>-</td>
<td>None</td>
</tr>
</tbody>
</table>

Source: World Bank team estimation based on audited financial statements of respective companies
Following recapitalization of the banks to meet the increase of capital requirements set by the CBA in 2016, the ratio of total capital to risk-weighted assets declined from 20.5% in Jan 2017 to 17.2% in July 2020.

Considering that the prudential minimum of capital adequacy ratio is 12%, only 5.2% of the total capital in the banking system or AMD 45.7 billion (US$93 million) is available for additional lending*.

Available funds for long-term infrastructure financing would be significantly small if we exclude medium and small banks because of their profile, strategy and existing client base.

*Assuming those loans have 0% risk classification rate.

The maximum size of a single loan for top 5 banks is in the range of **US$20-40 million**

Other banks are less likely to finance large (even syndicated) infrastructure, because:

- a) they are mostly retail banks with limited corporate exposure
- b) have much higher cost of funds and
- c) cannot offer competitive interest rates

Banks are also constrained by the exposure limit to a single borrower - 20% of a bank’s total capital – driven by financial stability considerations.

### Single borrower exposure limit of the banks

<table>
<thead>
<tr>
<th>Bank</th>
<th>Total Capital, AMD billion</th>
<th>Total Capital, US$ million</th>
<th>Single borrower limit, US$ million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ameriabank</td>
<td>101</td>
<td>211</td>
<td>42</td>
</tr>
<tr>
<td>ArmBusinessBank</td>
<td>52</td>
<td>109</td>
<td>22</td>
</tr>
<tr>
<td>Ardshinbank</td>
<td>78</td>
<td>162</td>
<td>32</td>
</tr>
<tr>
<td>ACBA</td>
<td>69</td>
<td>144</td>
<td>29</td>
</tr>
<tr>
<td>Inecobank</td>
<td>56</td>
<td>117</td>
<td>23</td>
</tr>
<tr>
<td>Converse Bank</td>
<td>45</td>
<td>94</td>
<td>19</td>
</tr>
<tr>
<td>Bank VTB</td>
<td>48</td>
<td>101</td>
<td>20</td>
</tr>
<tr>
<td>Armeconombank</td>
<td>60</td>
<td>125</td>
<td>25</td>
</tr>
<tr>
<td>Unibank</td>
<td>34</td>
<td>70</td>
<td>14</td>
</tr>
<tr>
<td>Araratbank</td>
<td>37</td>
<td>78</td>
<td>16</td>
</tr>
<tr>
<td>HSBC</td>
<td>42</td>
<td>87</td>
<td>17</td>
</tr>
<tr>
<td>Artsakhbank</td>
<td>42</td>
<td>87</td>
<td>17</td>
</tr>
<tr>
<td>Evocabank</td>
<td>30</td>
<td>62</td>
<td>12</td>
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<tr>
<td>IDBank</td>
<td>44</td>
<td>92</td>
<td>18</td>
</tr>
<tr>
<td>Byblos Bank Armenia</td>
<td>30</td>
<td>62</td>
<td>12</td>
</tr>
<tr>
<td>Mellat Bank</td>
<td>39</td>
<td>80</td>
<td>16</td>
</tr>
</tbody>
</table>

*Source: Финансовые Рейтинги Банков Армении, 2019, ArmInfo Information Company*
Corporate bonds mostly consist of 3-year debt paper issued by financial institutions – commercial banks and credit organizations. There are only 3 other smaller issuers representing mining, telecom and logistical services sectors with total outstanding volume of US$8.5 million.

Total market value of pension fund investments in corporate debt in all currencies as of the end of June 2020 is US$57 million, which is 9.5% of total NAV and 70% of Armenia’s corporate debt market.

69% of corporate issues are in AMD (equivalent of USD 40 million), 25% in US$ and 6% in EUR.

<table>
<thead>
<tr>
<th>AMD issues</th>
<th>Maturity</th>
<th>Coupon rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logistical services</td>
<td>24</td>
<td>12.5%</td>
</tr>
<tr>
<td>Mining, telecom</td>
<td>36</td>
<td>11.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>USD issues</th>
<th>Maturity</th>
<th>Coupon rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logistical services</td>
<td>24</td>
<td>8.5%</td>
</tr>
<tr>
<td>Mining, telecom</td>
<td>36</td>
<td>7.5%</td>
</tr>
</tbody>
</table>

Source: 2019 annual reports of pension funds (Amundi, C-Quadrat)
<table>
<thead>
<tr>
<th>Insurance market</th>
<th>Investment funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armenia’s insurance sector is small and still in the early stages of development</td>
<td>The investment fund industry is nascent, with one publicly offered collective investment fund with AUM of US$3 million that invests in listed government and corporate bonds</td>
</tr>
<tr>
<td>Insurance sector assets amount to US$140 million or 1% of total financial sector assets and are invested in bank deposits and government securities</td>
<td>The low savings rate, unsophisticated investor base, and high marketing expenses associated with such funds, plus competition from attractive levels of bank deposits, constrain development of the sector</td>
</tr>
<tr>
<td>Given the lack of life insurance, the sector is not a major provider of long-term domestic capital</td>
<td>Such funds are unlikely to be a significant source of long-term investment capital in the medium term</td>
</tr>
</tbody>
</table>
### Lack of technical capacity among local financiers and familiarity with project and structured finance is a barrier to infrastructure lending

- Banks exposure to the energy sector has been mainly limited to lending to SHPPs and retail energy efficiency.
- Banks have expressed interest to consider lending projects, if it is led by an IFI.
- This, apart from reducing the exposure of a bank in total lending project, is explained also by the fact that in such arrangements and IFI would normally acquire the expertise and incur the costs, associated with the due diligence.
- In cases when IFIs were ready to consider such opportunities with local banks, IFIs and banks had the issue of agreeing on possession rights to the borrower’s collateral and how it could be shared between IFI and a local bank.
- Lending to energy sector SOEs also poses both commercial and legal challenges for local banks. From a legal perspective, the property/shares of SOEs cannot be seized and therefore cannot serve as a collateral.
Unlocking New Sources of Finance
Pillar 1: Adoption and Implementation of PIM Framework

Robust PIM framework for identifying, preparing and selecting public investment projects is under construction and will streamline the process for developing bankable PPP pipeline which would stimulate increased interest from investors.

PIM should include the following key features across full life-cycle of investment projects:

- Step 1: Project Identification and Prescreening
- Step 2: Formal Project Pre-Appraisal and Appraisal
- Step 3: Independent Review of Appraisal
- Step 4: Project Prioritization and Selection
- Step 5: Project Implementation
- Step 6: Project Adjustment
- Step 7: Facility Operation
- Step 8: Review and Evaluation
<table>
<thead>
<tr>
<th>Issues</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipeline development bottlenecks</td>
<td>Identify potentially suitable PPP projects following appropriate generation and transmission planning approaches – least-cost generation planning - and prioritize them using the broader framework of PIM.</td>
</tr>
<tr>
<td>Lack of funding for project preparation</td>
<td>The Government to establish a centralized pool of funding/project development facility to serve as a one-stop project preparation fund for PPP projects, to be managed by the PPP Agency. The Government should consider options for capitalization of such a fund, including from the national budget or with donor support.</td>
</tr>
<tr>
<td>Prevalence of unsolicited proposals</td>
<td>Focus on the implementation of the PPP Law in order to encourage reliance on transparent and competitive procurement processes.</td>
</tr>
<tr>
<td>Absence of model contractual documents</td>
<td>Roll out PPP template documents (e.g. PPAs for large projects, Government Support Agreements) under the PPP legal framework, while leaving flexibilities to adapt documents to specific future deal needs.</td>
</tr>
<tr>
<td>Institutional capacity constraints</td>
<td>Ministry of Economy to prepare a comprehensive capacity building program based on skill requirements across the PPP project cycle. Identification of suitable PPP projects requires greater investment in building the staffing and technical capacity of the PPP Agency, MOF, and line ministries.</td>
</tr>
<tr>
<td>No guidance materials</td>
<td>PPP Agency to prepare a set of standardized materials to help guide institutions through each phase of the PPP project cycle. Given current capacity constraints within the PPP Agency, this can initially be outsourced to consultants, and update of the materials can form part of the PPP Agency’s future work program.</td>
</tr>
<tr>
<td>Lack of framework for assessment and management of government financial commitments under PPPs</td>
<td>MOF to develop a framework for assessment of financial commitments and contingent liabilities under PPPs to allow for assessment and management of all PPPs with clear criteria for approval of all financial commitments of the Government. The roll-out of such a framework should be accompanied by significant capacity building and training for relevant agencies to ensure the effective oversight of the Government’s fiscal commitments to PPPs.</td>
</tr>
</tbody>
</table>
Stakeholder Interactions and Responsibilities in SOE Corporate Governance Structure

- **Portfolio Ministry**
- **Ministry of Finance (MoF)**
- **Non-governmental shareholders**

**Shareholders**
- Report transparently to
- Provide capital to
- Act in interest of and are accountable to

**Managers**
- Regularly report and update
- Monitor and guide

**Directors (Board)**
- Independent Directors
- Govt. Representatives
- Other Board Members

**Pillar 3: Improvement of CG: Stakeholder Interaction**
<table>
<thead>
<tr>
<th>Issues</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board of Directors’ role is unclear and undervalued as compared with good corporate governance practices</td>
<td>Re-assess the role of SOE’s Board of Directors and align its authority with good practices in strategy-setting, determining performance objectives, monitoring Company’s financial and operational performance &amp; appointing, remunerating and removing management,</td>
</tr>
<tr>
<td>Board of Directors is not empowered to properly exercise their functions</td>
<td>Once the role of Board is clarified and agreed, formally document the Government’s delegation of authority and respective functions to SOE Board in the Company’s Charter</td>
</tr>
</tbody>
</table>
| HVEN Board of Directors does not have independent board members       | ➢ Identify and appoint at least two independent Board Members.  
➢ Set term limits for independence: once independent members have served on the board for 5 years; they are no longer considered independent |
| Board of Directors does not have clear division of responsibilities    | ➢ Identify and appoint Chairman of the Board and Corporate Secretary  
➢ Consider appointing an independent board member as the Chairman of the Board |
| Board of Directors does not have specialized committees for effective and specialized oversight of technical matters | ➢ Establish Board Committees, staffing them with board members possessing appropriate skills and experience, preferably headed by independent board members  
➢ In medium-term, SOEs may establish an Investment Committee to oversee matters related to implementation of public investment projects  
➢ Three board members per committee should suffice. Consider appointing an independent board member as the Chairman of the Committees |
| Board of Directors can be strengthened to have balanced skills set and industry background, while considering diversity aspects | ➢ Develop and introduce qualification and experience requirements for existing or potential board members, and evaluating their combined skills set  
➢ Appointing Government officials to the Board should be reduced with time |
## Issues

<table>
<thead>
<tr>
<th>Issues</th>
<th>Recommendations</th>
</tr>
</thead>
</table>
| Board of Directors compensation should be clearly formulated and free of undue influence | Adopt a clear remuneration policy for SOE Board members aligning it with the long-term interests of the Company. The policy should:  
- Be approved by the GMS  
- Not envisage compensation for the Government representatives working ex officio  
- Not envisage additional remuneration for the General director serving on the board  
- Be competitive, within reasonable limits and benchmarks  
- Introduce standard approach: i.e. fixed salary plus variable component for extra work/responsibility  
- Avoid compromising independent directors' objectivity |
| Board of Directors is not regularly evaluated                         | Develop and introduce annual evaluation mechanism for the Board effectiveness:  
- Launch the process from second year after adoption of the mechanism  
- Start with self-evaluation under the Chair’s supervision  
- Ultimately move to individual board member assessments  
- Consider engaging external experts for facilitated assessments |
| Lack of awareness about the Board members duties and how properly functioning board can bring value to SOE | Establish formal Board induction and training process to facilitate transition, sharpen skills, and enhance performance. Provide specific trainings to the board members, based on the evaluation results |
## Issues

<table>
<thead>
<tr>
<th>Issue</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOE management is not accountable to the Board of Directors for implementing the strategy, and adhering to the set operational and financial targets</td>
<td>Develop and establish clear accountability lines between SOE Board of Directors and its Executive Management via respective by-laws ensuring that executive management is accountable and reporting to the Board on SOE’s operational and financial results</td>
</tr>
<tr>
<td>Create linkage of SOE strategy and objectives with performance indicators and targets</td>
<td>Introduce regular (quarterly, annual) performance monitoring mechanism based on clear financial and non-financial performance indicators and targets that are linked to SOE strategy and objectives</td>
</tr>
</tbody>
</table>
| Remuneration is not linked to SOE performance and achievement of objectives | ➢ Design SOE performance monitoring system for keeping SOE management accountable for results  
  ➢ Implement transparent system of incentives for SOE management, linking it to SOE’s performance, considering potential sanctioning (dismissal, reappointment) |
### Issues

<table>
<thead>
<tr>
<th>Issues</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>HVEN has no Internal Audit function</td>
<td>Consider appointing Internal Auditors to oversee the SOE’s internal control system on an ongoing basis and be accountable directly to the Board’s Audit Committee</td>
</tr>
<tr>
<td>SOEs do not publish their annual reports and corporate governance statements at the company website</td>
<td>Start publishing full annual reports, corporate governance statements and other non-financial information to raise the Company’s corporate profile and increase transparency</td>
</tr>
<tr>
<td>Board of Directors require proper delegation of authority to carry its functions effectively</td>
<td>Formally document the Government’s delegation of authority and respective functions to HVEN Board of Directors, empowering it to properly exercise its functions and act as effective governance body. Delegated functions should cover: strategy-setting, appointing, remunerating and removing management boards, monitoring the Company’s performance and management’s efficiency</td>
</tr>
<tr>
<td>SOE’s corporate documentation requires revision to reflect targeted CG improvements</td>
<td>Update SOE charters and other corporate documentation to reflect proposed improvements in CG practices</td>
</tr>
</tbody>
</table>
## Issues Recommendation

<table>
<thead>
<tr>
<th>SOE Charter</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Expand the section on a board of directors, defining the number of board members and their appointment terms</td>
</tr>
<tr>
<td>➢ Once agreed, add core functions to the Board, such as strategy-setting, appointing, remunerating and removing management board, monitoring responsibility for the Company’s performance (via KPIs) and efficient internal controls</td>
</tr>
<tr>
<td>➢ Remove reference to inexistent body - Review Commission</td>
</tr>
<tr>
<td>➢ Introduce clauses on equal treatment of minority shareholders, their rights and protection mechanisms</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop and adopt internal by-laws, regulations, i.e. Regulation on the Board of Directors and its Committees, Regulation on the Corporate Secretary, Regulation on the Executive Body, Regulation on Related Party Transactions, Conflict of Interest, Information Disclosure Policy, etc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code of Ethics</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Draft and implement Code of Ethics</td>
</tr>
<tr>
<td>➢ Identify and inform about whistleblowing mechanisms and communication channels to report violations</td>
</tr>
<tr>
<td>➢ Include the code as part of all directorship/ employment contracts for board members, directors and employees</td>
</tr>
<tr>
<td>➢ Train staff to understand and apply code’s provisions and conduct periodic staff assessments to ensure a knowledge base</td>
</tr>
<tr>
<td>➢ Appoint a “lead” to oversee compliance</td>
</tr>
<tr>
<td>➢ Formalize incentives and penalties for compliance and violations</td>
</tr>
</tbody>
</table>
### Pillar 4: Improving Predictability of SOE Revenues from Regulated Tariffs (1)

**Adjustments should be made in tariff computation of power sector SOEs to increase predictability of revenues and thus enable access to capital markets**

#### Option 1: Revision of Return on Assets and depreciation method to allow for servicing of commercial debt

- **Return on Assets:** It is recommended that PSRC:
  - Elaborates tariff methodology to clarify that return on assets would be equal to **WACC of SOEs and how it would be computed**
  - Regularly adjust WACC using market indicators/benchmarks and to allow SOEs to service the debt
  - Fixes WACC for at least 3-year period and adjusts accordingly

- **Depreciation Expense:** It is recommended that PSRC:
  - Revise the depreciation from straight line (assuming 30-40 years asset life) to accelerated to match better with repayment of principal under commercial debt

#### Option 2: Inclusion of actual costs of debt service into the tariff consistent with terms of commercial financing agreements

- **Return on Assets:** It is recommended that PSRC:
  - Includes in the tariff of power sector SOEs the debt service costs as per schedules in the relevant legal documents
  - Adjusts the return on assets and depreciation expense accordingly to avoid double-counting of same category of expenses. Specifically, if SOE gets debt service, then it should not also get depreciation on the same asset otherwise it will be double-counting

---

**Multi-Year O&M**

- It is recommended that PSRC:
  - Approves annual O&M expenses for at least 3 years
  - Specifies cost-efficiency coefficient (reduction from previous level) to be applied to those expenditures after each revision based on similar coefficients applied to well-performing utilities
  - This would increase predictability of operating cash flows
PSRC should specify and publicly disclose the approach to computation and adjustment of ROA for power sector SOEs.

ROA (equal to WACC) is one of the most important components of companies’ tariff and its computation and adjustment methodology should be clearly specified and transparent to allow commercial lenders to estimate predictability of cash flows of SOEs.

### Share of Debt and Equity

<table>
<thead>
<tr>
<th>Share of Debt and Equity</th>
<th>60:40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Free Rate ($r_{rf}$)</td>
<td>1.58%</td>
</tr>
<tr>
<td>Sovereign Debt Premium (DP)</td>
<td>3.18%</td>
</tr>
<tr>
<td>Cost of US$ Debt ($r_{rf} + DP$)</td>
<td>4.76%</td>
</tr>
<tr>
<td>FX Risk Premium ($FX_{rp}$)</td>
<td>4.43%</td>
</tr>
</tbody>
</table>

### Typical structure for utility companies

- **Country default spread estimation based on rating:** as of Jan 1, 2021; Damodaran Online; Source: [http://pages.stern.nyu.edu/~adamodar/](http://pages.stern.nyu.edu/~adamodar/)
- **Was estimated as the difference in yield between 10-Y Armenian Government Eurobond issue and 10-Y AMD bond issue:** Source: [http://moneymarket.am/index.php?language=Eng&page=menuinfo&id1=1&id2=2&id3=1](http://moneymarket.am/index.php?language=Eng&page=menuinfo&id1=1&id2=2&id3=1)

### Cost of US$ Debt ($r_{rf} + DP + FX_{rp}$)

9.19%

### Country Equity Risk Premium ($r_m$)

8.21%

### Rating based equity risk premium;

as of Jan 1, 2021; Damodaran Online; Source: [http://pages.stern.nyu.edu/~adamodar/](http://pages.stern.nyu.edu/~adamodar/)

### Sectoral Risk ($\beta$)

1.00

### Cost of Equity in AMD ($r_e = r_{rf} + r_m \times \beta + FX_{rm}$)

14.22%

### Corporate Profit Tax Rate (T)

20%

### Pre-tax WACC

11.21%

### Post-tax WACC

10.10%
Development of a robust pipeline of PPP projects and quality project preparation can increase attractiveness of power projects to large commercial lenders

- **Pipeline development bottlenecks.** Identify potentially suitable PPP projects following appropriate generation and transmission planning approaches – least-cost generation planning - and prioritize them using the broader framework of Public Sector Investment Prioritization

- **Project preparation funding.** It is recommended that a centralized pool of funding is created to serve as a one-stop project preparation fund for PPP projects, to be managed by the PPP Agency. The Government should consider options for capitalization of such a fund, including from the national budget or via donors

- **Model PPP documents.** The Government has taken an ad-hoc approach to prepare transaction documents for the past projects reaching financial close. It is recommended to take lesson learnt from past projects and to roll out PPP template documents (e.g. PPAs for large projects, Government Support Agreements) under the PPP legal framework, while leaving flexibilities to adapt documents to specific future deal needs
Pension funds’ limited involvement in infrastructure finance to date has been conditioned by a small universe of domestic investable instruments. Demand from SOEs in form of bankable projects will create the supply.

Pension funds are well placed to finance power sector investments due to their long-term liabilities. As such, pension funds can extend financing at very long maturities (15-20 years) matching their long-term liabilities.

On assumption that average nominal wages increase by 4 percent p.a. and the number of beneficiaries reaches 800,000 over the next 10 years, **AUM are forecast to exceed US$4.9 billion by the end of 2030.**

Close to 2/3 of funds are held in Government bonds and deposits. And 1/3 of funds are invested in foreign currency denominated instruments.

**Pension funds would be suitable source of long-term financing for power sector investments**
Key Benefits:

1. **Diverse investor base.** Crowdfunding allows accredited international investors (both individual and institutional) to participate in debt financing and/or provide equity to infrastructure projects.

2. **Ease of access.** The crowdfunding allows substantial accessibility of projects for especially small retail investors because the digital platform operator does due diligence and pre-selects the transactions/deals which are opened to investors/lenders.

3. **Experience to learn from.** There is global track-record with crowdfunding platforms financing infrastructure. Examples:
   - **Developed markets:** Mosaic (United States), Windcentrale (Netherlands), Funding Societies (Singapore), CitizenEnergy (EU)
   - **Emerging and frontier markets:** EstateGuru (Estonia), Neofinance (Lithuania), Investree (Indonesia), Afluenta (Argentina), Nexus (Brazil)

**Next Steps:**

1. Central Bank of Armenia (CBA) to make the required legal and regulatory changes to allow for creation, licensing, and operation of crowdfunding companies
2. Prioritize development of a bankable set of PPP projects
## Terms of Financing Available for Power SOEs

Capital markets would become accessible for power SOEs if key previously-listed challenges are addressed

- Five largest banks and institutional investors surveyed
- All surveyed financial institutions expressed interest subject to addressing the key issues identified in this report
- All surveyed financial institutions reported increased interest in provision of long-term financing to SOEs if credit-enhancement is available (e.g. IBRD guarantee)

### US$ Lending Terms without Credit Enhancement

<table>
<thead>
<tr>
<th>Tenor</th>
<th>7 years</th>
<th>Tenor</th>
<th>5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grace</td>
<td>-</td>
<td>Grace</td>
<td>-</td>
</tr>
<tr>
<td>Interest rate</td>
<td>8%</td>
<td>Interest rate</td>
<td>11%</td>
</tr>
</tbody>
</table>

### AMD Lending Terms without Credit Enhancement

<table>
<thead>
<tr>
<th>Tenor</th>
<th>10 years</th>
<th>Tenor</th>
<th>7 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grace</td>
<td>-</td>
<td>Grace</td>
<td>-</td>
</tr>
<tr>
<td>Interest rate</td>
<td>7%</td>
<td>Interest rate</td>
<td>9%</td>
</tr>
</tbody>
</table>

Source: World Bank estimation based on results of market sounding
Tariff Impacts of Long-Term Commercial Financing
### Tariff Impacts of Long-term Commercial Financing

#### Approach to Projection of Tariffs

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Demand Projection:</td>
<td>Base Case electricity demand growth of 2%</td>
</tr>
<tr>
<td>2</td>
<td>Projected Electricity Generation:</td>
<td>Use of electricity dispatch simulation assuming Base Case/Least-Cost Plan</td>
</tr>
<tr>
<td>3</td>
<td>Capex of New Generation:</td>
<td>All new RE based on project finance: All future PPAs at US$0.031/kWh*</td>
</tr>
<tr>
<td>4</td>
<td>Capex of New T&amp;D:</td>
<td>As per Energy Strategy 2040 and ENA Investment Plan for 2020-2027</td>
</tr>
<tr>
<td>5</td>
<td>Depreciation</td>
<td>Straight line method based on useful economic life of assets</td>
</tr>
<tr>
<td>6</td>
<td>Fuel Costs</td>
<td>As per projections for purposes of Least-Cost Planning</td>
</tr>
<tr>
<td>7</td>
<td>Non-fuel operating and maintenance</td>
<td>Using existing items in the tariff escalated with projected GDP deflator</td>
</tr>
</tbody>
</table>
| 8    | Debt Service | - In case of public debt - as per amortization schedule and interest costs in agreements  
- In case of private debt:  
  Option 1: Increase of ROA and accelerated depreciation  
  Option 2: Increase of ROA and unchanged depreciation method. Used for this analysis  
  Option 3: Existing ROA and accelerated depreciation return on assets |

*Conservative assumption to simplify the analysis; the capital costs for solar PV and wind are expected to reduced further*

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*World Bank Group Energy & Extractives*
Among SOEs, HVEN and YTPC would have the largest need to access commercial financing

- HVEN has more than US$400 million in sovereign-guaranteed debt part of which may need to be refinanced with commercial borrowing to free up fiscal space for decommissioning of ANPP (estimated to cost at least $200 million*) and other sectors.
- HVEN needs another US$230 million for rehabilitation of three substations, strengthening of transmission network to integrate additional RE, and participation in Georgia-Romania Power and Digital Interconnect Project.** Sovereign-guaranteed debt may not be feasible given macroeconomic fundamentals and outlook.
- YTPC has around US$40 million in public debt that may require refinancing.

Other SOEs do not have major capital expenditure programs requiring them to access capital markets:

- ANPP has secured $300 million of public debt to carry out its life extension investment program, no other major upcoming investment needs, and expected decommissioning within next several years.
- EPSO is a system operator with very modes investment needs.

Commercial financing options analyzed

- Uncovered commercial financing in US$
- Uncovered commercial financing in AMD
- Commercial financing in US$ with IBRD guarantee
- Commercial financing in AMD with IBRD guarantee

*This is the Government’s estimated from 2011 and was not verified and/or updated by the World Bank or any other party.

** Given complexity and size of this project, financing options would be explored as part of the ongoing feasibility study commissioned by GSE (Georgia).
### HVEN loans for refinancing were prioritized based on a method considering time to first installment, repayment period, and interest rate

<table>
<thead>
<tr>
<th>Loan</th>
<th>First repayment date</th>
<th>Final repayment date</th>
<th>Time to first installment, TFI (months)</th>
<th>Ranking by TFI</th>
<th>Weight in combined score</th>
<th>Repayment period (months)</th>
<th>Ranking by Repayment period</th>
<th>Weight in combined score</th>
<th>Interest rate (INT)</th>
<th>Ranking by INT</th>
<th>Weight in combined score</th>
<th>Combined score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunir FZE Loan: 400 kV OHL</td>
<td>15-Mar-20</td>
<td>15-Mar-21</td>
<td>0</td>
<td>1</td>
<td>10%</td>
<td>3</td>
<td>1</td>
<td>70%</td>
<td>3.00%</td>
<td>3</td>
<td>20%</td>
<td>1.40</td>
</tr>
<tr>
<td>KfW Loan: Gyumri-2</td>
<td>30-Dec-14</td>
<td>30-Jun-24</td>
<td>0</td>
<td>1</td>
<td>10%</td>
<td>42</td>
<td>2</td>
<td>70%</td>
<td>2.76%</td>
<td>4</td>
<td>20%</td>
<td>2.30</td>
</tr>
<tr>
<td>EDBI Loan: 400 kV OHL</td>
<td>15-Mar-22</td>
<td>15-Sep-26</td>
<td>15</td>
<td>11</td>
<td>10%</td>
<td>54</td>
<td>3</td>
<td>70%</td>
<td>4.00%</td>
<td>1</td>
<td>20%</td>
<td>3.40</td>
</tr>
<tr>
<td>KfW Loan: CTNP I</td>
<td>30-Dec-19</td>
<td>30-Dec-29</td>
<td>0</td>
<td>1</td>
<td>10%</td>
<td>108</td>
<td>4</td>
<td>70%</td>
<td>1.85%</td>
<td>5</td>
<td>20%</td>
<td>3.90</td>
</tr>
<tr>
<td>KfW Loan: CTNP III</td>
<td>30-Dec-20</td>
<td>30-Dec-30</td>
<td>0</td>
<td>1</td>
<td>10%</td>
<td>120</td>
<td>5</td>
<td>70%</td>
<td>1.80%</td>
<td>6</td>
<td>20%</td>
<td>4.80</td>
</tr>
<tr>
<td>IBRD Loan: ETNIP</td>
<td>15-Nov-29</td>
<td>15-Nov-39</td>
<td>107</td>
<td>14</td>
<td>10%</td>
<td>120</td>
<td>5</td>
<td>70%</td>
<td>1.21%</td>
<td>7</td>
<td>20%</td>
<td>6.30</td>
</tr>
<tr>
<td>IDA Credit: ETDP</td>
<td>5-Jun-08</td>
<td>5-Dec-33</td>
<td>0</td>
<td>1</td>
<td>10%</td>
<td>156</td>
<td>7</td>
<td>70%</td>
<td>0.50%</td>
<td>13</td>
<td>20%</td>
<td>7.60</td>
</tr>
<tr>
<td>IBRD Loan: ESRP</td>
<td>15-Nov-21</td>
<td>15-May-36</td>
<td>11</td>
<td>10</td>
<td>10%</td>
<td>174</td>
<td>8</td>
<td>70%</td>
<td>1.21%</td>
<td>7</td>
<td>20%</td>
<td>8.00</td>
</tr>
<tr>
<td>ADB Loan: PTRP</td>
<td>15-Nov-19</td>
<td>15-May-39</td>
<td>0</td>
<td>1</td>
<td>10%</td>
<td>221</td>
<td>11</td>
<td>70%</td>
<td>3.14%</td>
<td>2</td>
<td>20%</td>
<td>8.20</td>
</tr>
<tr>
<td>IBRD Loan: ESRP AF</td>
<td>15-Aug-24</td>
<td>15-Feb-39</td>
<td>44</td>
<td>12</td>
<td>10%</td>
<td>174</td>
<td>8</td>
<td>70%</td>
<td>1.21%</td>
<td>7</td>
<td>20%</td>
<td>8.20</td>
</tr>
<tr>
<td>KfW Credit: PTRP</td>
<td>30-Jun-08</td>
<td>30-Dec-38</td>
<td>0</td>
<td>1</td>
<td>10%</td>
<td>216</td>
<td>10</td>
<td>70%</td>
<td>0.75%</td>
<td>10</td>
<td>20%</td>
<td>9.10</td>
</tr>
<tr>
<td>KfW Credit: Gyumri-2</td>
<td>30-Jun-19</td>
<td>30-Jun-49</td>
<td>0</td>
<td>1</td>
<td>10%</td>
<td>342</td>
<td>13</td>
<td>70%</td>
<td>0.75%</td>
<td>10</td>
<td>20%</td>
<td>11.20</td>
</tr>
<tr>
<td>EIB Loan: CNTP I</td>
<td>16-Apr-20</td>
<td>16-Oct-43</td>
<td>0</td>
<td>1</td>
<td>10%</td>
<td>274</td>
<td>12</td>
<td>70%</td>
<td>0.48%</td>
<td>14</td>
<td>20%</td>
<td>11.30</td>
</tr>
<tr>
<td>KfW Loan: CTNP</td>
<td>30-Dec-24</td>
<td>30-Dec-54</td>
<td>48</td>
<td>13</td>
<td>10%</td>
<td>360</td>
<td>14</td>
<td>70%</td>
<td>0.75%</td>
<td>10</td>
<td>20%</td>
<td>13.10</td>
</tr>
</tbody>
</table>

Note: Calculations were done for a baseline date of Dec 31, 2020
# TARIFF IMPACTS OF LONG-TERM COMMERCIAL FINANCING

## New Project Financing and Existing Debt Refinancing Schedules

### Financing for new HVEN Investments for Substations

<table>
<thead>
<tr>
<th>Unit</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
<th>2028</th>
<th>2029</th>
<th>2030</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shahumyan-2 substation</td>
<td>MUS$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>20.00</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>20.00</td>
</tr>
<tr>
<td>Marash substation</td>
<td>MUS$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>20.00</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>20.00</td>
</tr>
<tr>
<td>Yeghegnadzor substation</td>
<td>MUS$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>20.00</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>20.00</td>
</tr>
<tr>
<td></td>
<td>MUS$</td>
<td>-</td>
<td>-</td>
<td>20.00</td>
<td>20.00</td>
<td>20.00</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>60.00</td>
</tr>
</tbody>
</table>

### Proposed refinancing schedule of HVEN loans

<table>
<thead>
<tr>
<th>Unit</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
<th>2028</th>
<th>2029</th>
<th>2030</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>KfW Loan: Gyumri-2</td>
<td>MUS$</td>
<td>3.83</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3.83</td>
</tr>
<tr>
<td>EDBI Loan: 400 kV OHL</td>
<td>MUS$</td>
<td>43.16</td>
<td>37.99</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>81.15</td>
</tr>
<tr>
<td>KfW Loan: CTNP I</td>
<td>MUS$</td>
<td>-</td>
<td>-</td>
<td>45.84</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>45.84</td>
</tr>
<tr>
<td>KfW Loan: CTNP III</td>
<td>MUS$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>25.49</td>
<td>23.06</td>
<td>-</td>
<td>-</td>
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<tr>
<td>IBRD Loan: ESRP</td>
<td>MUS$</td>
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<td>-</td>
<td>-</td>
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<td>-</td>
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<tr>
<td>ADB Loan: PTRP</td>
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<td>-</td>
<td>-</td>
<td>-</td>
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<td>IBRD Loan: ESRP AF</td>
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<td>-</td>
<td>-</td>
<td>-</td>
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<td></td>
<td>MUS$</td>
<td>46.99</td>
<td>37.99</td>
<td>45.84</td>
<td>25.49</td>
<td>23.06</td>
<td>23.14</td>
<td>21.49</td>
<td>15.94</td>
<td>261.54</td>
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### Proposed refinancing schedule of YTPC loans

<table>
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<tr>
<th>Unit</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
<th>2028</th>
<th>2029</th>
<th>2030</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>IBRD Loan: ETNIP</td>
<td>MUS$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>16.59</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>16.59</td>
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<tr>
<td>IBRD Power Sector Financial Recovery Loan</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>21.45</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>21.45</td>
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<td></td>
<td>MUS$</td>
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<td>16.59</td>
<td>21.45</td>
<td>-</td>
<td>-</td>
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<td>38.04</td>
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TARIFF IMPACTS OF LONG-TERM COMMERCIAL FINANCING

Foreign Currency vs Local Currency Refinancing

- Commercial financing of HVEN and YTPC, including refinancing of existing debts, would raise the end-user tariff only by 2-3% vs “No Commercial Financing Scenario”
- Credit-enhancement has beneficial impact to achieve much-needed extension of maturity

Tariff projections include new required investments in electricity generation, transmission, and distribution.
Public debt refinancing with foreign currency denominated commercial debts will smooth out the debt service requirements of power sector SOEs.

However, pre-tax ROA of more than 12% would be required to cover the debt service costs of HVEN and YTPC in case of AMD borrowing.

The rate of return on the regulated asset base and/or the asset depreciation rate would have to increase to ensure the cost recovery of power sector SOEs.

In select years, the cost recovery levels of the rate of return for HVEN are estimated to be around 14% for FCY refinancing and 20% for LCY refinancing. For YTPC, the respective cost recovery levels of the rate of return could be around 15% for FCY refinancing and 20%-21% for LCY refinancing.

In the long-run, the end-user power tariff will rise by 2.2%-3.2% relative to the base case scenario of “no public debt refinancing”.

Refinancing of existing public borrowing of HVEN and YTPC can release at least $300 million for MOF to spend on other pressing needs.
Designing energy benefits at the household level generally requires decisions about: (i) How to target the vulnerable population, (ii) How to deliver the benefit (i.e., modality – whether in terms of cash benefit, in kind, or tariff discount) , (iii) How to define the benefit amount, and (iv) Financing source.

Further analyses on the following is needed when evaluating subsidy delivery options:

- **Economic distortion**—the degree to which each option distorts marginal cost price signals and/or distorts consumption patterns and preferences
- **Administrative and fiscal costs**—the administrative and fiscal cost burden imposed on the Government as a result of administering and funding the subsidy program.
- **Coverage**—the extent to which all poor households receive the subsidy in different modalities
- **Targeting and leakage**—the extent to which the subsidy is exclusively delivered to poor households (efficiency of delivery)
Potential World Bank Group Support
### POTENTIAL WORLD BANK GROUP SUPPORT

| Pillar 1: Development of Wind Resources | - Geospatial analysis to identify sites for proper wind resource measurements  
- Feasibility study including site-specific wind resource measurements  
- Support in structuring of project financed transaction with competitive procurement process for first utility-scale wind project |
| --- | --- |

| Pillar 2: Development of PPP Pipeline and Strengthening of PPP Agency Capacity | - Support with development of bankable pipeline of PPP projects within broader PIM framework  
- Strengthening of capacity of MTAI in project identification and preliminary assessment  
- Strengthening of capacity of PPP Agency in screening and evaluation of projects as well as FCCL (Financial Commitment and Contingent Liability) assessment capability. |
| --- | --- |

| Pillar 3: Preparing HVEN and YTPC for a diversified funding sources | - Implementation of corporate governance improvements including ISO standards on operational, management, environmental systems, and cyber security  
- Support to PSRC to implement improvements to tariff-setting framework to improve predictability of SOE cash flows for commercial financiers  
- Support companies to obtain credit ratings by reputable international agencies  
- Facilitate companies to design a financing plan to diversify their funding sources (local, international banks and capital market solutions)  
- Support companies to work with transaction advisors to implement and execute specific financing (with potential IBRD guarantee support) |
| --- | --- |

| Pillar 4: Further Improvement of Tariff Impact Mitigation Mechanisms | - Support to the Government in evaluation of social impacts of various tariff scenarios  
- Advice on further improvement of mechanisms to mitigate impact of tariff increases on socially vulnerable consumers |
| --- | --- |
Annex
There were 17 active banks with total assets of AMD 5,828 billion (US$12.2 billion) as of the end of 2019.

Total banking sector assets significantly grew significantly over the past decade from 45 percent of GDP in 2010 to 89 of GDP in 2019, partly due to an increase in the minimum capital requirement.

Bank lending in GPD has similarly doubled from 27.4 percent in 2010 to 52.1 in 2019.

The financial sector is dominated by commercial banks.

<table>
<thead>
<tr>
<th>Financial institutions</th>
<th>Assets (Dec 31, 2019)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>AMD billion</td>
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<tr>
<td>Banks</td>
<td>5,828.00</td>
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<tr>
<td>Credit organizations</td>
<td>711.50</td>
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<tr>
<td>Pension funds</td>
<td>251.20</td>
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<tr>
<td>Insurance companies</td>
<td>66.90</td>
</tr>
<tr>
<td>Investment firms</td>
<td>63.50</td>
</tr>
<tr>
<td>Total</td>
<td>6,921.10</td>
</tr>
</tbody>
</table>

Corporate lending makes up about 60% of total loan book of domestic banks.

Reduction of the dollarization level from the high of 64% in 2010 to 45% in 2019 supported the notable increase in local currency lending.

Mid-term (1-5 years) and long-term loans (>5 years) are 23% and 44% of the total loan book of the domestic banks respectively, while mid-term and long-term deposits represent only 15% of total deposits.

Loans to energy sector (generation, transmission and distribution) are only 3.2% of total bank lending or US$245 million with only a third in AMD.

Bank lending to the energy sector has reduced since recapitalization 2016.
Nearly 70% of pension funds are invested in the local market with 94% in local currency

- As of the end of July 2020, **53% of local currency (AMD) denominated assets are held in fixed income instruments** – government bonds (43%) and corporate bonds (10%)
- The remaining 47% are invested in AMD term deposits
- **82%** of local currency denominated government bonds **comprise** of 10-Y and 20-Y government bonds **with YTM of 7.7% and 8.3%** respectively
- **US$ denominated 10-Y government bonds** maturing in on Sept 26, 2025, and March 26, 2029, are currently **trading at 4.3% and 4.5%** respectively

Source: World Bank team estimation based on “Финансовые Рейтинги Банков Армении, 2019, ArmInfo Information Company”
The OECD Guidelines on Corporate Governance of State-Owned Enterprises are the internationally agreed standard for how governments should exercise the state ownership function to avoid the pitfalls of both passive ownership and excessive state intervention.

OECD Guidelines recommend a clear distinction of roles between the state, ownership entities, boards, and management. The aim is to separate decision-making from ownership responsibilities to avoid conflicts of interest and disincentives.

→ The state as owner should be responsible for defining and communicating SOE ownership policy and objectives, including any entity-specific objectives for individual SOEs.

→ Boards should be charged by the state with overseeing the development of a strategy to achieve the objectives, and to monitor progress. Boards should be ultimately responsible for the entity’s performance to its shareholders - state or non-state.

→ Executive management is accountable to the board for implementing corporate strategy. Strategy is normally developed by the executive management and proposed to the board for approval, though in a minority of cases strategies may be imposed top-down.

The recommendations of the Guidelines are tailored to the current needs of SOEs taking into account Armenia’s legislative framework and regulatory environment.