

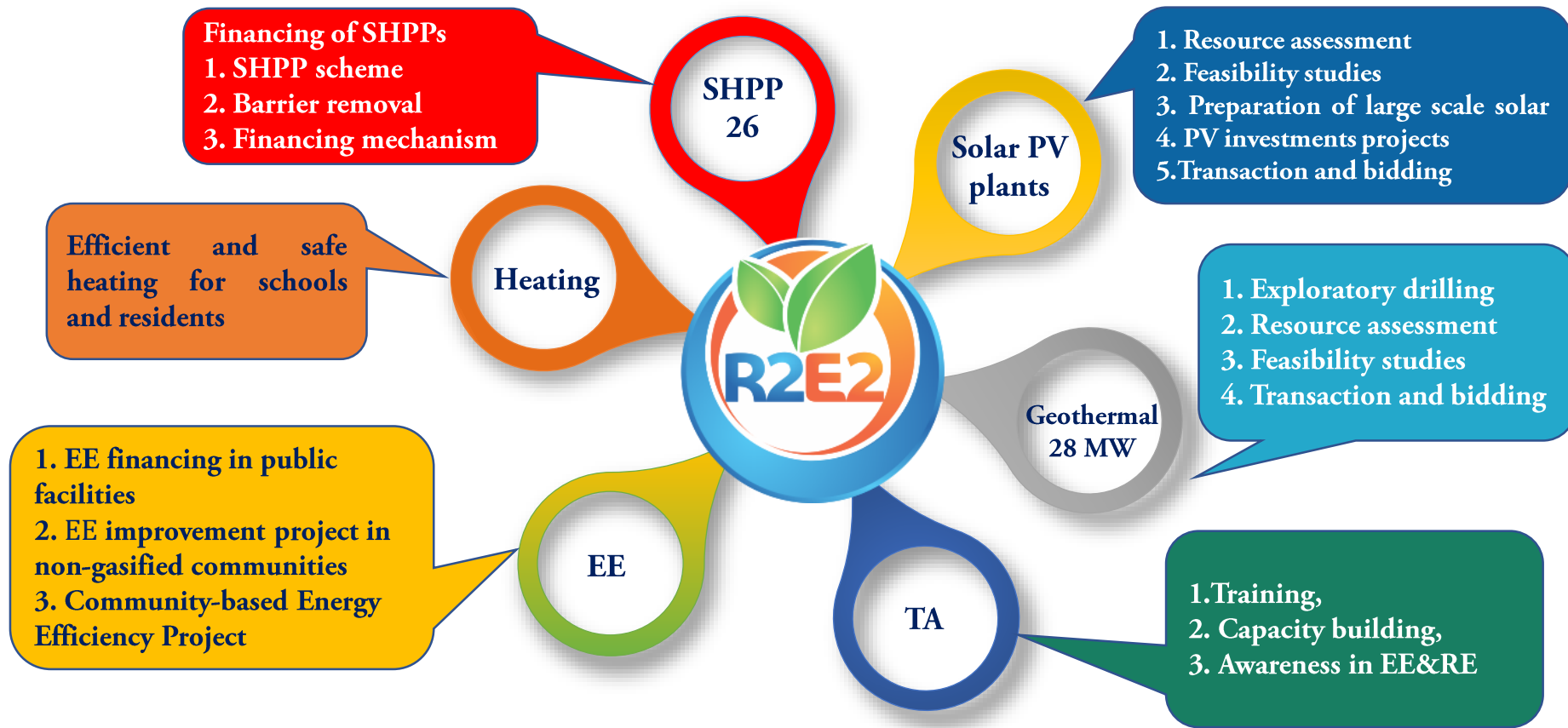


SUCCESSFUL APPLICATIONS IN ENERGY EFFICIENCY

R2E2 Fund Armenia

- Established in 2005 by Gov. Decree following the Law on Energy Efficiency and Renewable Energy of RA
- Mission – facilitate investments in EE&RE area
- Objective – create financing mechanism for EE&RE
- Management – BOT and Director
- BOT – Key Ministries, Central Bank, Regulatory Commission, NGO, Private sector (12 members)
- Beneficiaries – Gov., communities, public and municipal agencies, residents, private investors, society
- Initial funding – the WB financed Urban Heating Project, REP

THE MAIN ACTIVITIES OF THE R2E2 FUND: 2006-2019



ENERGY EFFICIENCY PROJECT

The project development objective is to reduce energy consumption of social and other public facilities. The Project introduced of Innovative Procurement method- NPV based Procurement.

Energy Saving Measures were implemented in Yerevan and all marzes Number of ESM Contracts signed - 64

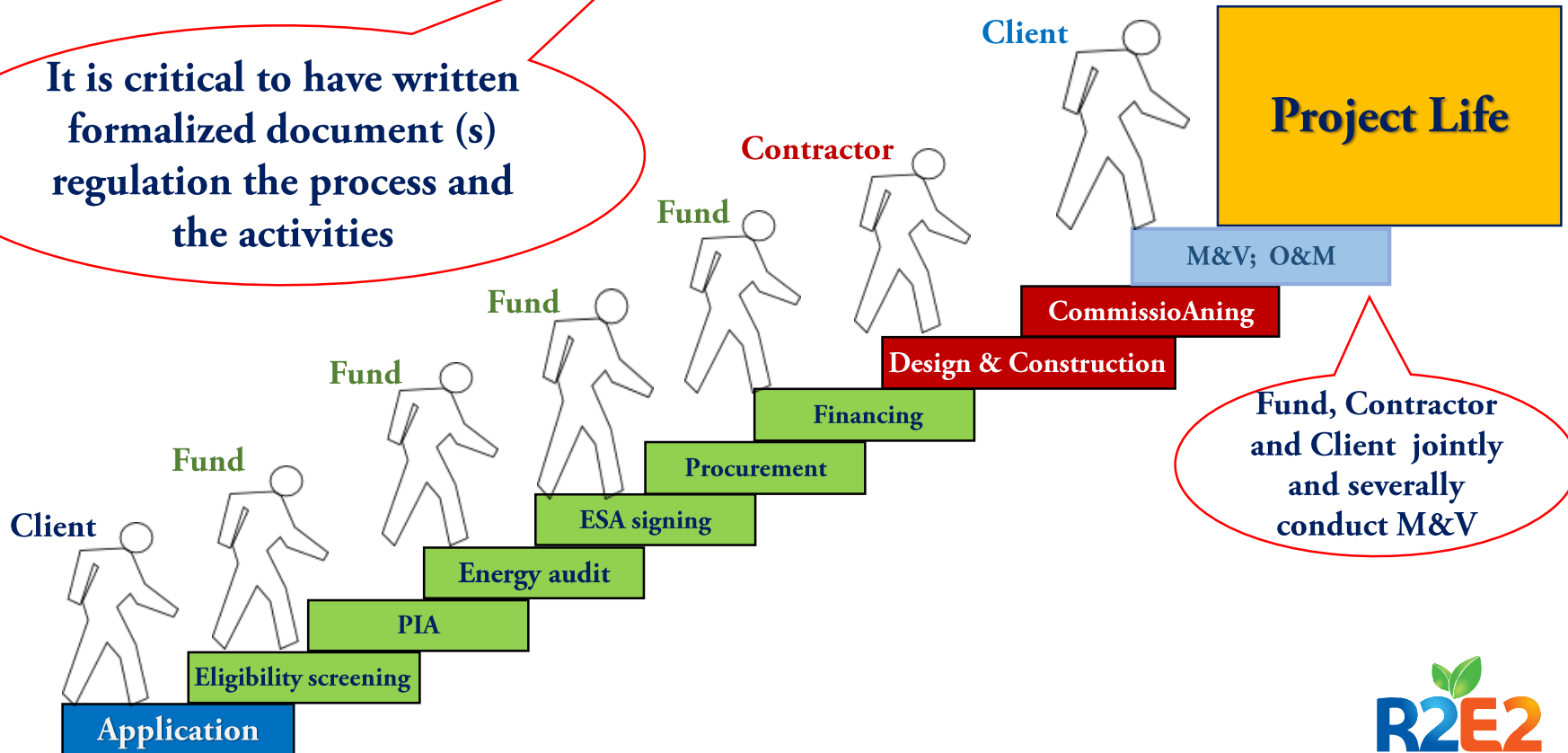
- 26** – Educational institutions (schools, kindergarten, university),
- 11** – Penitentiaries
- 9** – Street lighting
- 7** – Administrative (municipal, government)
- 5** – Health (hospitals, clinics)
- 5** – Cultural (theatres)
- 4** – Scientific research institution

MAIN RESULTS

Number of buildings involved in the Project – 180
Total Investment – 10.35 mln. USD
Payback 4-8 years, average 6 years
Energy Efficiency up to 79 %, average 50%
CO2 annual reduction - 7223 tonn

STEPS.....

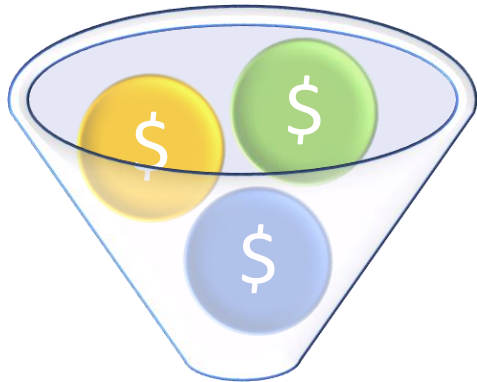
It is critical to have written formalized document (s) regulation the process and the activities



CRITERIA AND PROCEDURES

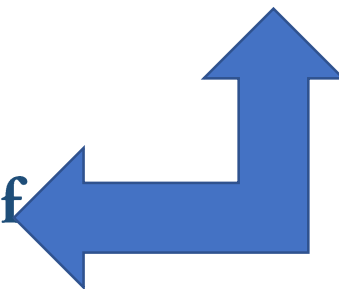
- Public or municipal building and street lighting
- Without serious damage (2nd level of emergency or less)
- Comfort level >50%
- 100 % of investment in ESM should be repaid in less than 10 years
- 10 % of investments is paid as service fee during the repayment time (2,5% per annum)
- Services include: Energy audit, procurement and contract management, technical supervision, M&V, financing
- Procurement follows WB rules (NCB) modified for output based tender. The bid is for design, construction and 1 year O&M
- Bidders offer ESMs, savings %, price and NPV
- The bidder with highest NPV offer is awarded contract
- The 20% of contract price is paid after verification of savings

ARMENIA EEP: FINANCING OF INVESTMENTS: 2013-16

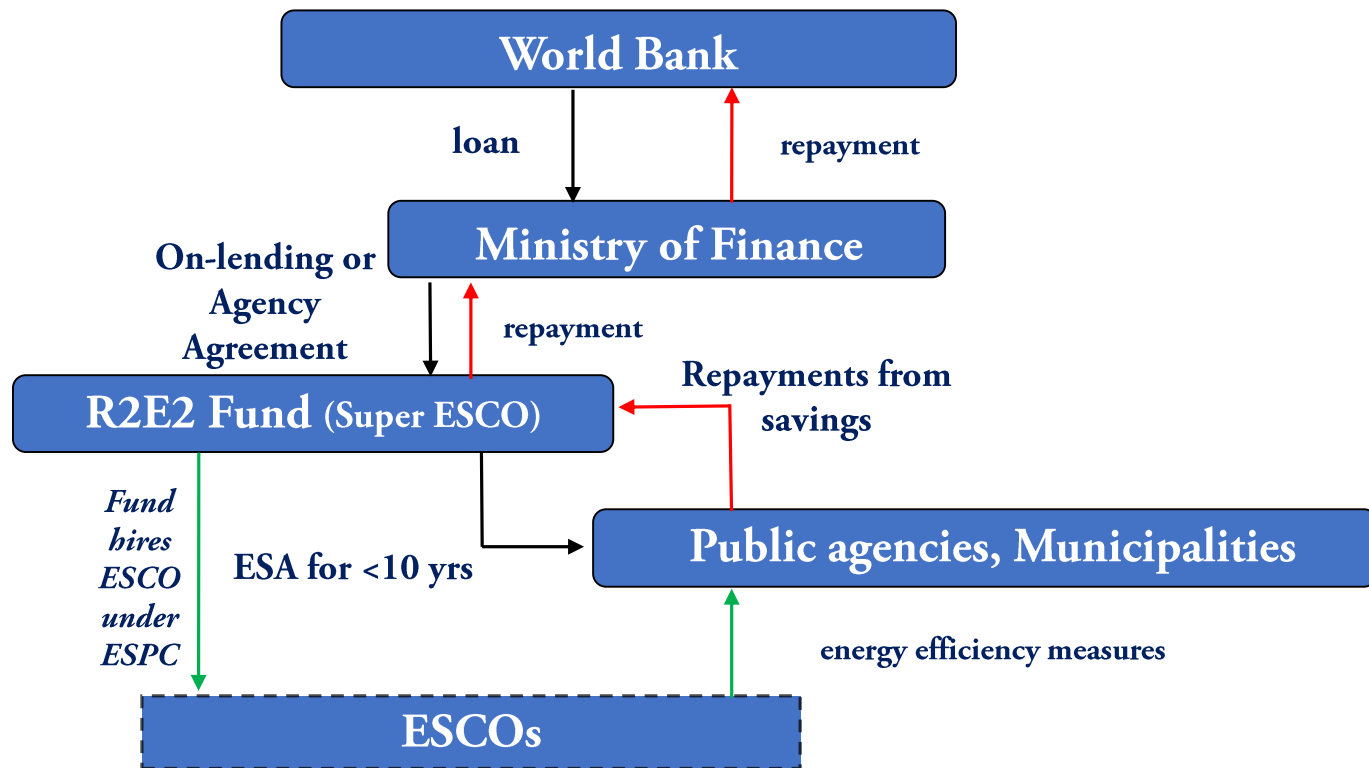


**Saving from energy bill of
public agencies finances
the new investments in
other PAs**

| Funding sources | No of public facilities | USD |
|------------------------------|-------------------------|--------------------------------------|
| WB/GEF grant, \$2mln. | 167 | 8,7 mln.has financed 11,4 mln. |
| Of which \$0,7mln. for ESMs | | |
| R2E2 Revolving Fund, \$8mln. | | |



ARMENIA EEP: FINANCING MECHANISM SUPER ESCO



ENERGY SERVICE AGREEMENT- ESA

- Performance-based contract between service provider and the client
- Service provider agrees to finance, develop and deploy energy efficiency project for client
- Without any upfront capital expenditures from the client's side
- The client agrees to pay back the project costs through energy savings over the ESA term
- Savings occur immediately after the energy efficiency project
- Savings are usually measured in kilowatt-hours (kWh) for the same operational conditions
- At the end of the ESA term, after the full costs of the project have been paid off through energy cost savings, the client retains all of the savings

REPAYMENTS UNDER ESA

Repayment consists of

- Energy efficiency investments (design, construction, 1st year O&M)
- Service fee - 2.5% per annum on investments (about 10% of investments)

Form of Payment

- Client opens special account in a bank or treasury, deposits there an amount equivalent to the baseline annual energy consumption, then makes all payments to the utilities and to the Fund from that account
 - Opt.1. Client pays bills and the rest of amounts transfers to the Fund
 - Opt.2. Client pays according to agreed schedule and retains the balance
- In all cases Clients preferred Opt.2

Starting date of payments

- The 1st day of the next month after the commissioning.
- Payment for each month is made before the 15th day of the next month.

SUBJECT OF THE AGREEMENT

Energy (saving) services, including

- Energy audit, identification of the baseline;
- Planning and implementation of the energy saving measures
- Procurement services for ESMs
- Procurement of technical supervision services;
- Payments for ESMs and other services;
- Instruction of the relevant staff of Beneficiary;
- Monitoring of energy consumption after the ESMs;
- Evaluation and verification of energy savings;
- Management of payments and other activities envisaged.

Performance-based procurement and contract management

ESA implemented in Armenia

Key design features of performance-based procurement and contract management, including rationale for Net Present Value (NPV)-based selection and combination of the design/civil works/O&M in one contract. Key aspects for bidding documents. Comparing the standard and modified bidding documents and processes. Outreach to potential bidders. NPV calculations and evaluation of bids. Contractor payment schedule and verification of performance element. Contract supervision and management. Capacity building activities for bidders. Lessons learned based on Armenian experience.

RATIONALE FOR PERFORMANCE BASED CONTRACTING

- Meet the minimum energy saving identified during the energy audit
- Allowed bidders to propose the best technological options without price concern
- Maximize energy savings and value to the client;
- Introduce output based payment
- Introduce performance-based approach
- Maximizing the benefits per dollar invested
- Increase technical capacity of contractors and develop ESCo market by learning-by-doing approach
- Develop technology market through the demand for advanced technologies and not the cheapest options

BIDDING AND CONTRACTING

- The bidding process for ESMs is initiated after signing of the PIA (Project Initiation Agreement)
- Procurement follows WB rules (NCB). The bid is for design, construction and 1 year O&M
- Bidders offer ESMs, savings %, price and NPV
- The bidder with highest NPV offer is awarded contract, provided
 - the Bid is substantially responsive to the bidding documents,
 - the Bid specifies a technically feasible option
 - the Bid meets the minimum annual energy saving level specified
 - the Bidder has been determined to be eligible and qualified.
- The 20% of contract price is paid after verification of savings
- The Contract is signed with winner only after signing of the ESA by the applicant
- The Contract is becoming a part of the ESA

PAYMENT SCHEDULE

- 20% - advance payment against a suitable bank guarantee;
- 10% - after acceptance of design;
- 50% - after actually completed works;
- 10% - performance-based payment (confirmed based on the results of the heating season).
- 10% - after 365 days of successful O&M services have been completed successfully, (ii) all the defects notified to the Contractor before the end of this period have been corrected (iii) that the achieved level of the savings is the same or higher.

No more than 80% - Performance based payment after completion of ESMs and commissioning, and signing of the Certificate of Completion (Certificate of the Acceptance Committee on Commissioning of Completed Works)

DESIGN AND CONSTRUCTION

- The 1st stage of the Contract is engineering design performed by the qualified licensed company.
- The Contractor starts works only after approval of the design documents by the Fund and licensed expertizing firm.
- Design may be changed during the contract implementation if there are technical issues, if the beneficiaries request such reasonably, etc.
However, it is recommended to avoid it
- Construction works are supervised not only by Fund, but also by licensed specialized agency.
- Construction works should follow the design documents and specifications
- Activity schedule is used (bill of quantity may be used for complex projects)



ENERGY EFFICIENCY PROJECT



KANAKER-ZEITUN MEDICAL CENTER IN YEREVAN: BEFORE-AFTER



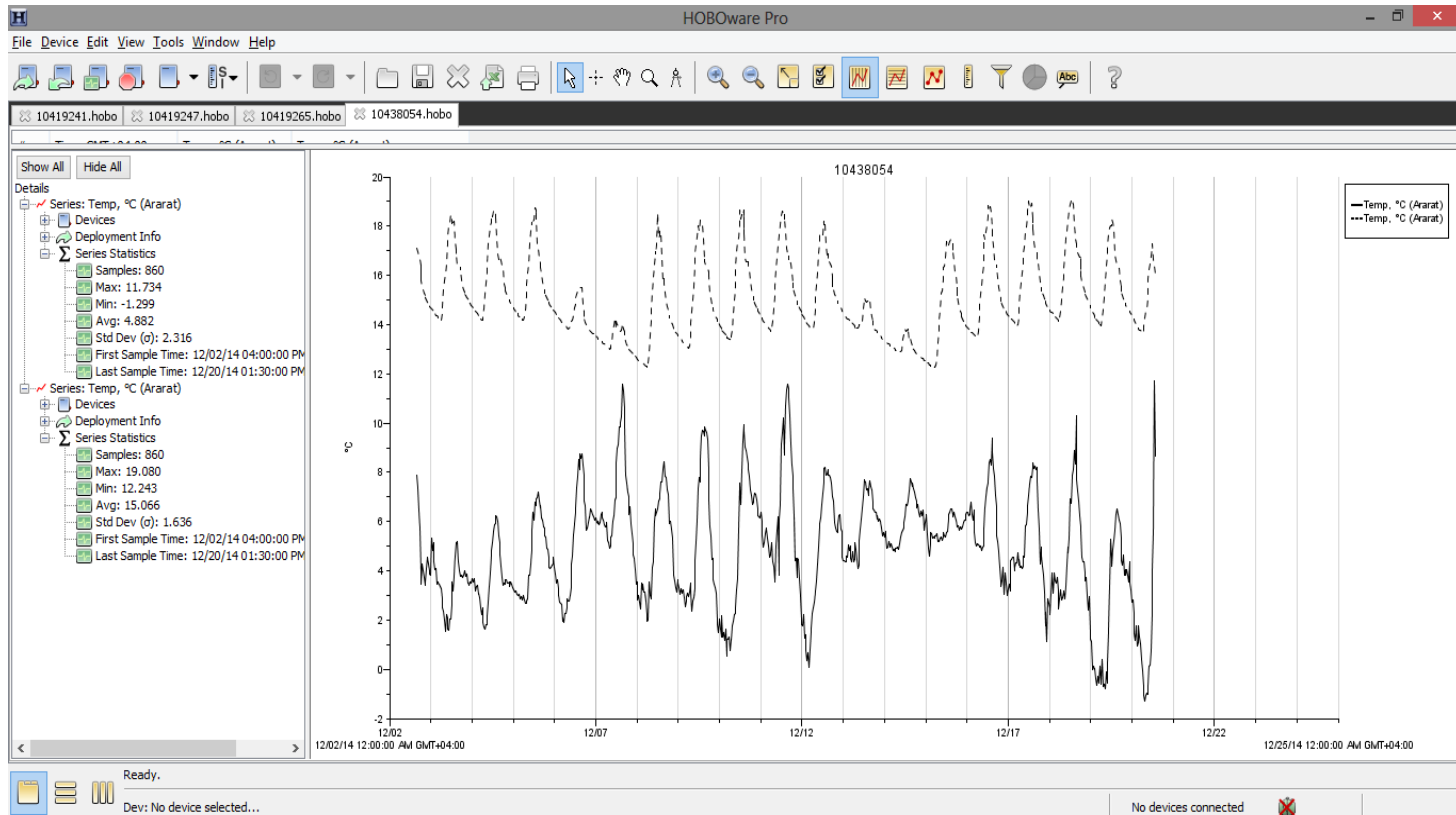
EE investments \$322,000
Annual savings \$41,223

Simple payback 8 years
Service fee \$25,350

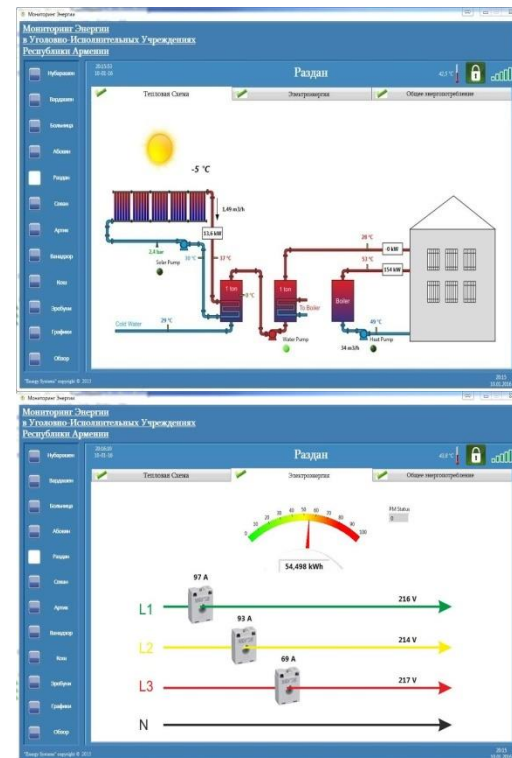
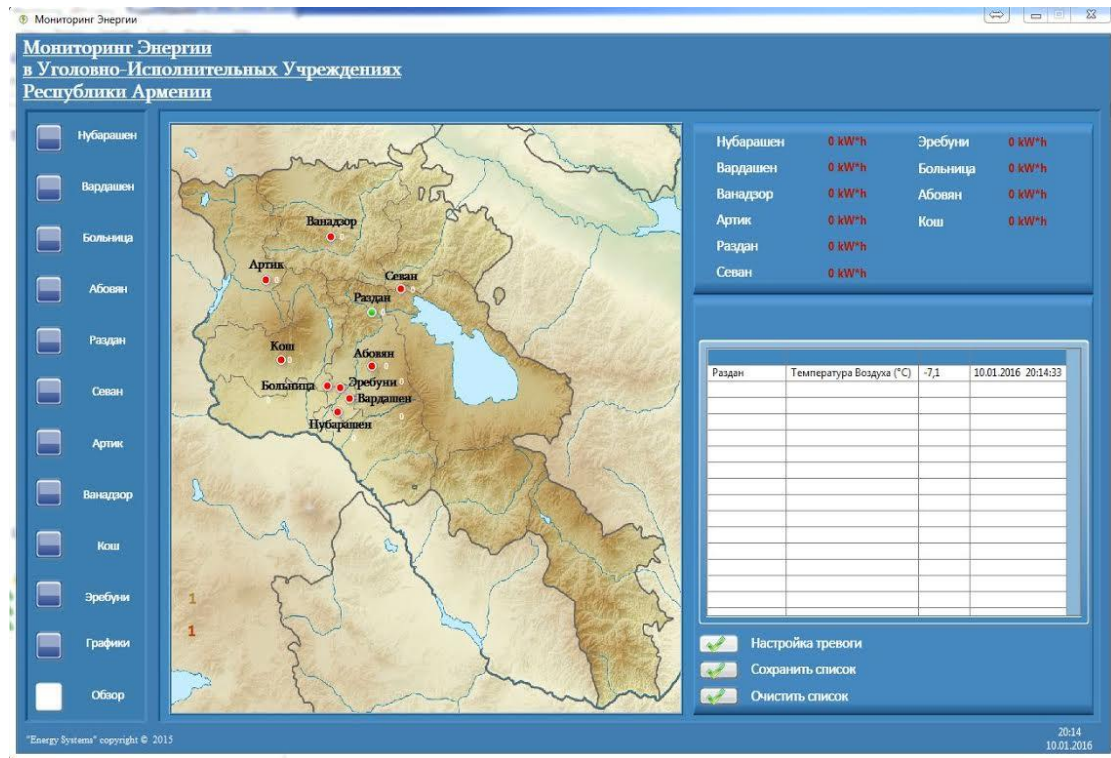
MEASUREMENT AND VERIFICATION, O&M

- **M&V is conducted jointly by the beneficiary and contractor. Fund does its own measurement and verification activities using special devices.**
- **The Contractor and the beneficiary signed under the same documents where the comfort level and energy consumption is described.**
- **If the savings are less than promised by contractor, the latest is penalized and the same amount is reduced from the investment cost to be paid back**

TEMPERATURE DATA LOGGER



ONLINE MONITORING



REPAYMENTS

- More than 100% repayment rate (ahead of schedule)
- No delays for more than 30 days period
- Penalties for delays are applied
- Two cases with extension of repayment period for 1 year
- Early repayments are encouraged
- After repayment of investment the service fee is not applied
- No requirement for collateral

TRANSITION FROM WORLD BANK PROJECT TO COUNTRY-SYSTEMS

- Legal-regulatory
 - Make EE as an obligatory requirement for all public and municipal construction and renovation
 - Use output based contracts if applied by public procurement
 - Prepare amendments to the public procurement legislation based on the best experience
- Extensive training of the engineering design institutions on EE measures increases the usage of such measures during the design under the PP
- Implementation of the NPV based procurement creates market for EE technologies, suppliers, ESCos that can offer their services for PP
- Technical regulations, norms and standards will create sustainable transformation in the country
- It is always possible to adapt the EE into the country systems!



...The revolving fund is sustainable if the risks of repayments are balanced with innovative project management procedures...



THANK YOU

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