

Best Practice: Financing of EE in Public Buildings

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Financing of EE in Public Buildings

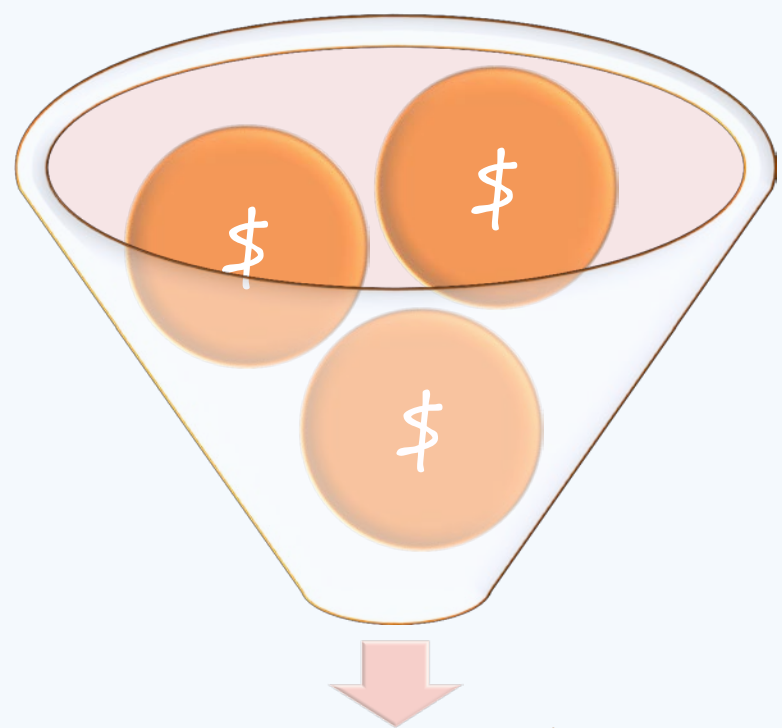
- Why Public Buildings?
- What is funding source?
- Financing mechanism
- Procurement mechanism
- Technologies
- Results
- Monitoring
- Impact

Why Public Buildings?

- Exemplary role of the government!
 - To test mechanism and demonstrate benefits of EE investments
 - To identify barriers and take actions to remove them
 - To ensure direct benefit to the state budget
 - To remove perception risks
 - To increase level of quality of public services
- The most vulnerable group
 - Limited budget for energy bills and renovation
 - Underoccupation while financing is per person
 - Low level of comfort
 - Need for renovation without perspective of refinancing

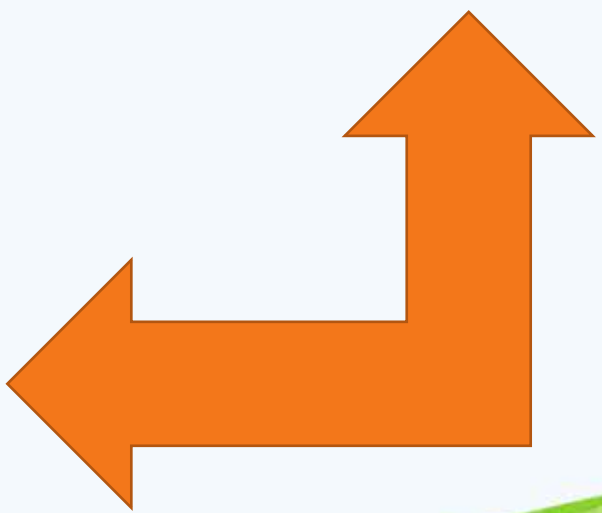
School	Kindergarten
University	Theatre
Jails	Administrative buildings
Olympic school	Municipal lighting

Funding Source of Investments in EE Project

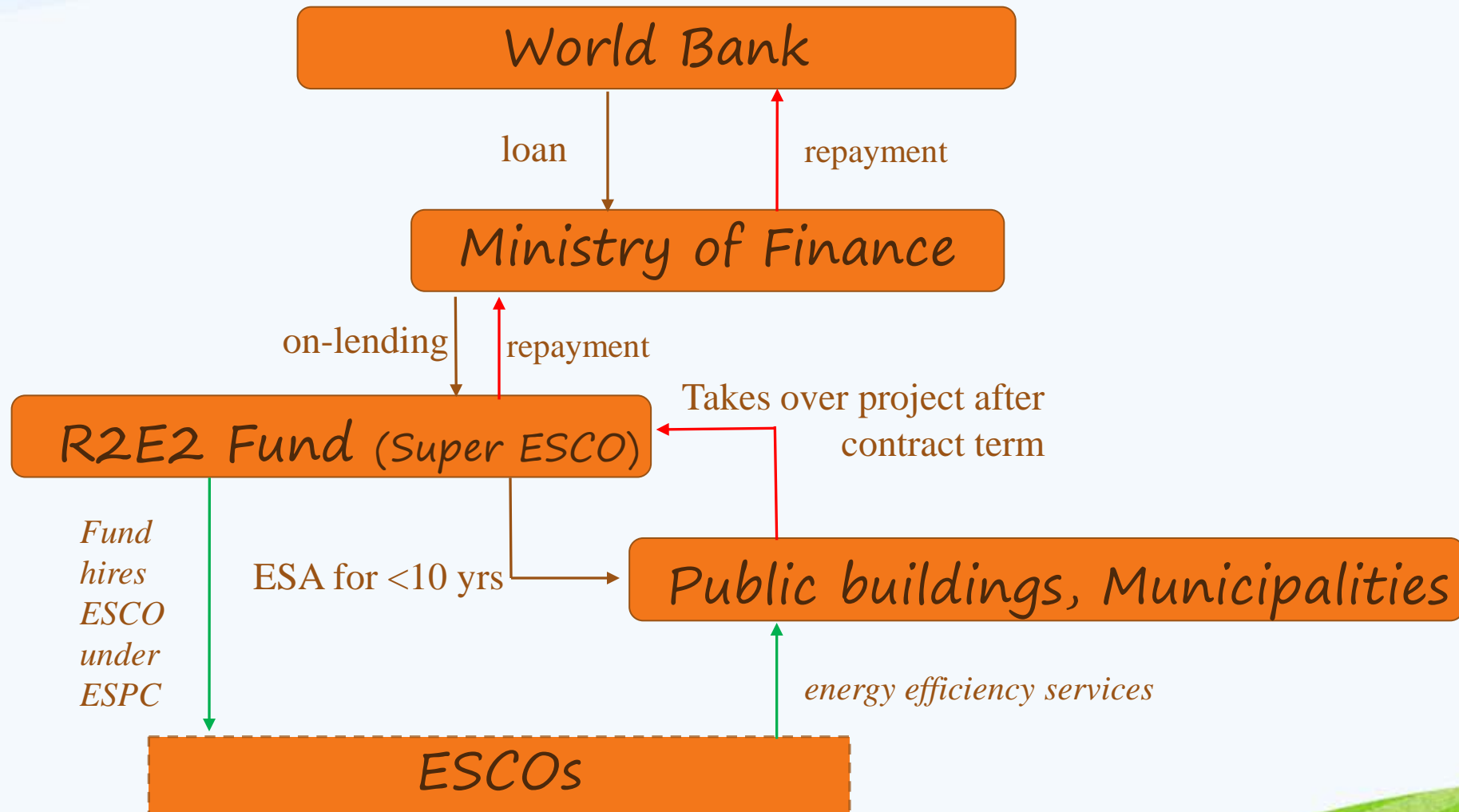


Saving from energy bill finances investments

Funding sources	No of public facilities	USD
WB/GEF grant	157	8,1m/n.
GoA-taxes		
R2E2 Revolving Fund		



Financing Mechanism – Super ESCO



Selection Criteria for Public Facilities

Facility type – public and local administration buildings, schools, kindergartens, hospitals, public lighting

Requirements – sound building structures, no plans for facility closing/privatization

Additional selection criteria

- Comfort level over 50%
- Technical energy savings potential over 30%
- Payback period less than 10 years

Funding Mechanism

- Revolving Fund - provided by MoF to the R2E2 for 2006-2045 to implement EE and RE projects
- Multiple usage of funds during the given period serves more beneficiaries
- Selection of beneficiaries on FIFO approach based on criteria
- Signing Project Initiation Agreement with beneficiary
- Energy audit, procurement of contract for engineering design, construction and 1 year O&M, engagement of technical supervision by R2E2
- Signing of ESA with beneficiary (with repayment schedule)
- 2,5% per annum for R2E2 services
- Commissioning of the system
- Monitoring, M&V reporting, O&M jointly for 1st year
- Delivery of savings and repayment by beneficiaries during payback period



Procurement Scheme

- R2E2 conducts procurement based on WB NCB procedures
- Contract includes design, construction and 1 year O&M – with performance-based payments
- Project is defined by minimum level of energy savings based on preliminary energy audit
- Bidder must bid on technology proposed to meet the minimum energy savings specified
- Bids are submitted in single envelop (technical & financial)
- Evaluation is based on (i) technical feasibility to meet promised energy savings, and (ii) highest net present value

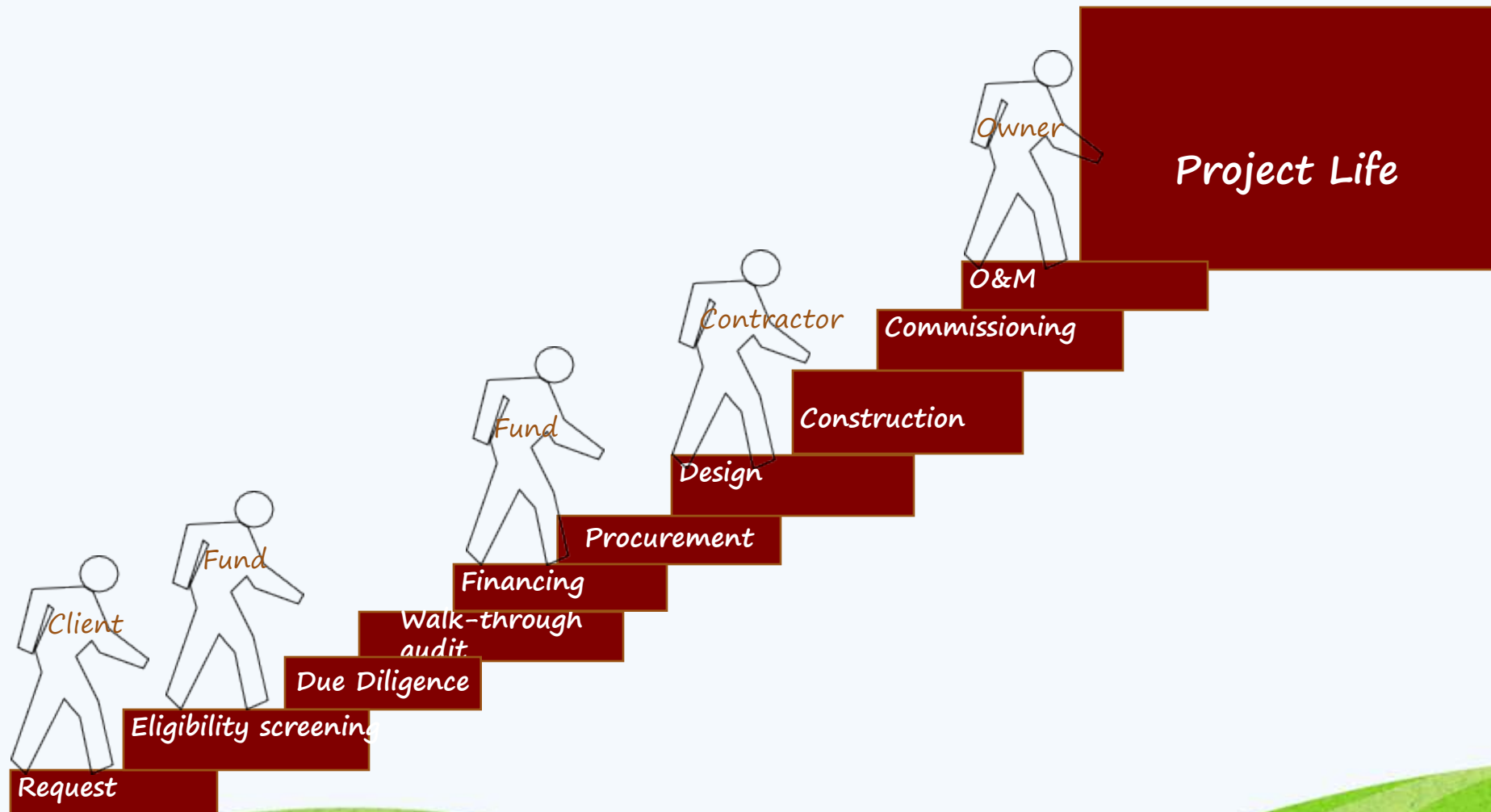
Typical EEMs



- Replacement of windows and doors
- Installation of dividers from insulating materials
- Reduction of glazed surface
- Insulation of walls and roofs
- Heating system installation and upgrade
- Solar water heating
- Heat pumps
- LED lighting

Mkryan Ashot

Steps.....



Yerevan School #61



Triple glazed windows on sunny side

Investment, AMD

19 000 000

Annual Savings %

59.1%

Annual CO2 emissions reduction, t

35.3

Energy savings in 20 years of operation, AMD

102,140,880

Payback, years

6.0

168,872 kWh or
18,160m³ gas or
2,832,960 AMD



Before....

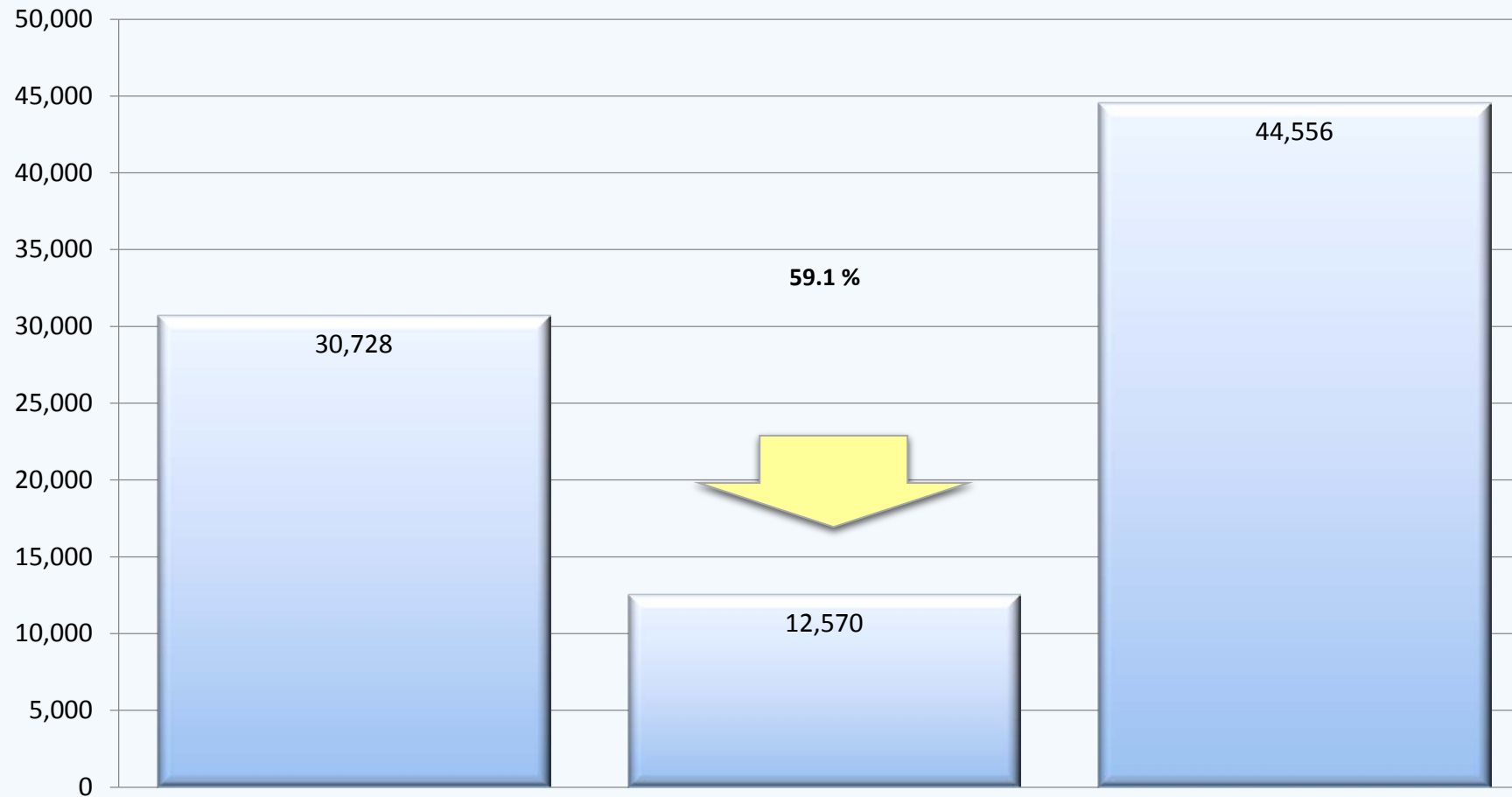
Annual consumption 285,772 kWh, or
30,730 m³ gas

After....

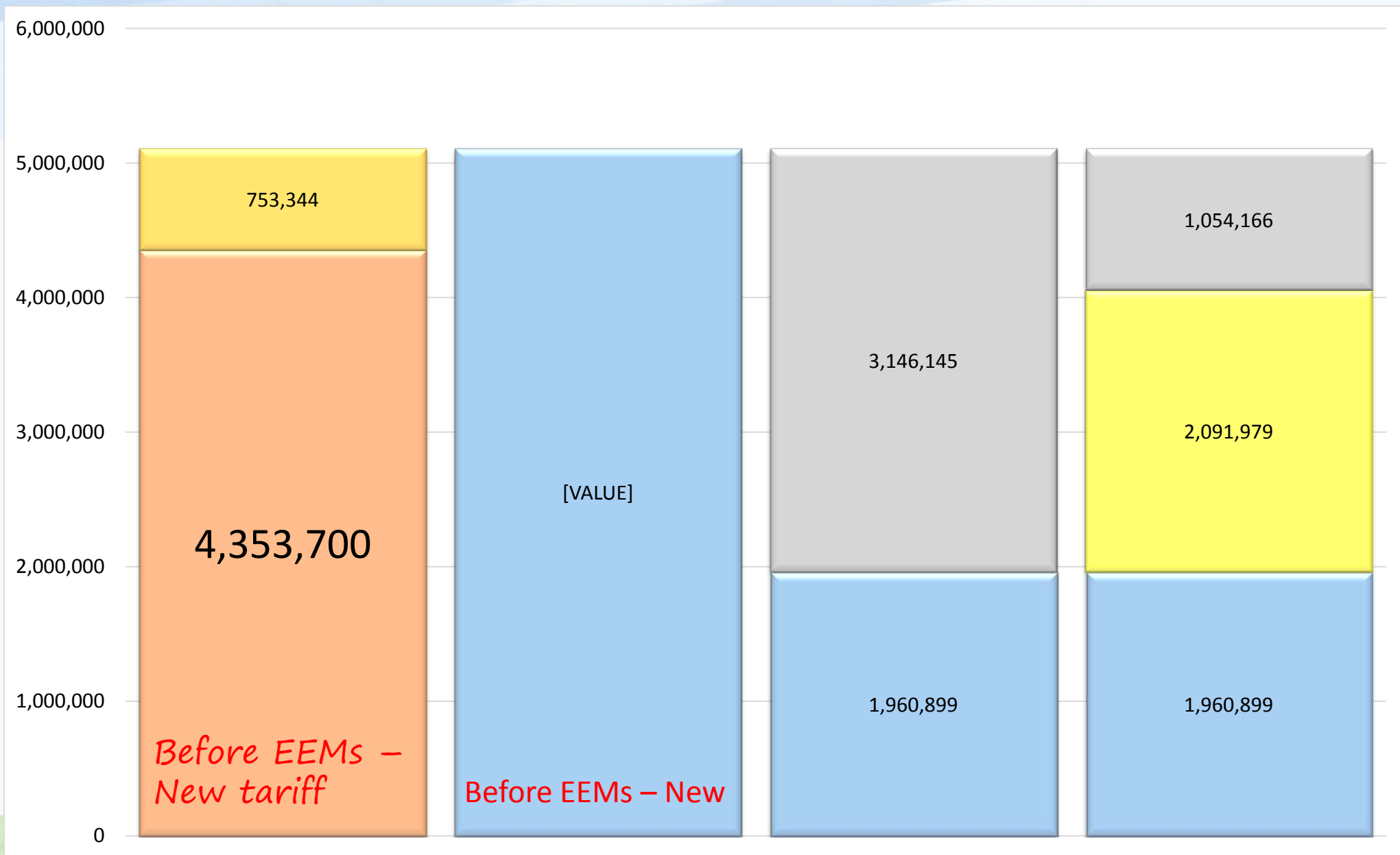
Annual consumption 116,900 kWh, or
12 570 m³ gas

Reduction of annual consumption of gas

Before EEM, after EEM and without EEM



Savings and Repayment



Results

- Energy savings – 415,688,463 kWh
- Savings in cash –
- Average saving level – 50,8%
- Reduced CO₂ – 112,165 t
- Committed investments – \$8,1 mln.
- Number of public facilities – 79 commissioned and 78 ongoing

Benefits




- Better conditions for employees and clients increases quality of public services
- Due to the improved comfort the number of clients is increasing with corresponding financing for the extended services
- Behavioral changes happen to assure sustainable performance of buildings and systems
- Capacity enhancement for operational and managerial staff
- “Think greener” becomes reality there
- Awareness raising among the clients and employees

Lessons learned

1. Demand based approach assures commitment of beneficiary to the project
2. Initial screening by R2E2 provides information on building condition and operation of public agency thus reducing risks
3. Repayment mechanism provides more funds to serve more clients
4. Repayment mechanism increases ownership, accountability and quality of energy management of the beneficiary
5. Result based payment increases quality of work
6. Design-build approach promotes technology supply market
7. Contract award based not on the lowest price but on highest NPV allows performing more efficient EEMs





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