ENERGY EFFICIENCY IN PUBLIC BUILDINGS NAMA EL SALVADOR

FIIAPP COOPERACIÓN ESPAÑOLA

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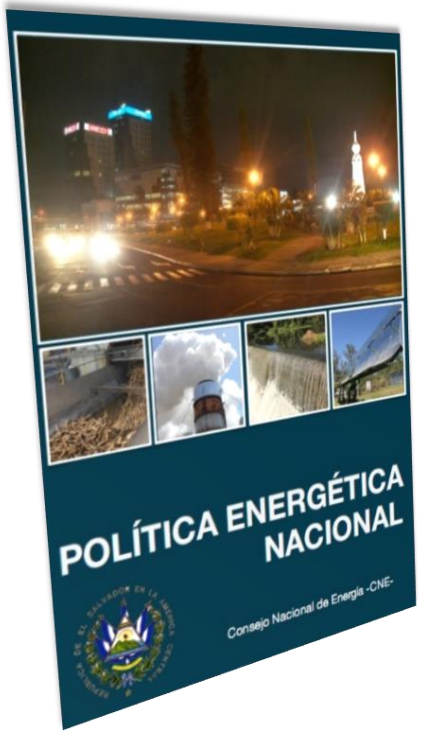
CNE Consejo Nacional de Energía

GOBIERNO DE EL SALVADOR UNÁMONOS PARA CRECER

Cooperación Española MEDIO AMBIENTE / ARAUCLIMA

Strategic Guidelines for National Energy Policy



- Diversification of energy matrix and promotion of renewable energy resources.
- Electricity sector´s institutional strengthening
- Promoting a culture of efficiency and energy saving
- Innovation and technological development
- Expansion of coverage an preferential rates
- Regional energy integration

Energy Efficiency in the Public Sector

Strategy

- Demonstrative and replicable actions.
- Obligations to public institutions with legal frameworks already established.
- The state has limited resources and energy costs.
- To raise awareness and train public employees on EE issues as a multiplying factor.
- Diversity of applications (office buildings, hospitals, ports, airports, etc.)

Implementation

1. Characterization of energy consumption: WHERE-HOW-HOW
2. Identification of energy efficiency measures
3. Pilot project: Identification of barriers, demonstration actions and creation of mechanisms
4. Sustainability actions

Energy Efficiency in the Public Sector

Energy Efficiency in the Public Sector

- The energy sector in El Salvador is one of the main emitters of greenhouse gases (GHG) of the total emissions in the country.
- The National Energy Policy is focused on the implementation of actions that promote energy savings and optimize the use of energy sources.
- The government is already working on initiatives to promote the implementation of good practices in energy efficiency and energy saving.
- The Government of El Salvador, through the National Energy Council (CNE) and the Ministry of Environment and Natural Resources (MARN) has worked on the project "**Development of Nationally Appropriate Mitigation Action (NAMA) in the Public Building sector in El Salvador**".

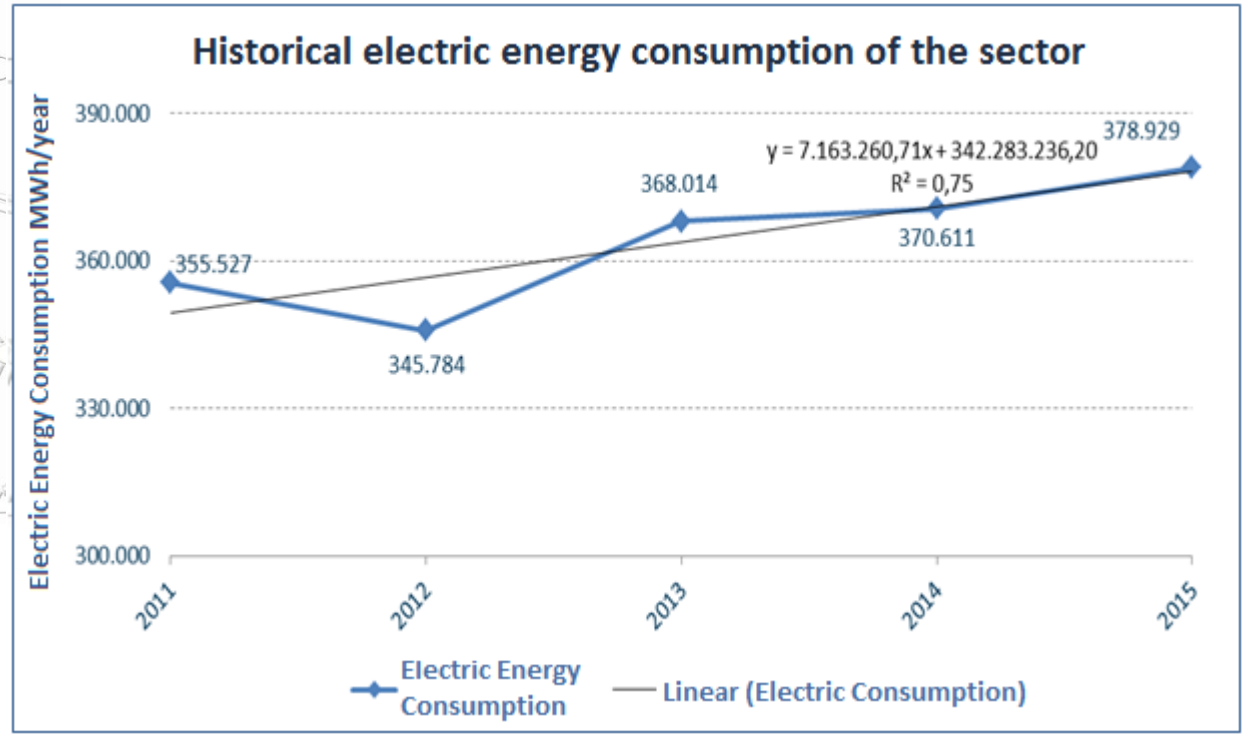
Approach to the NAMA

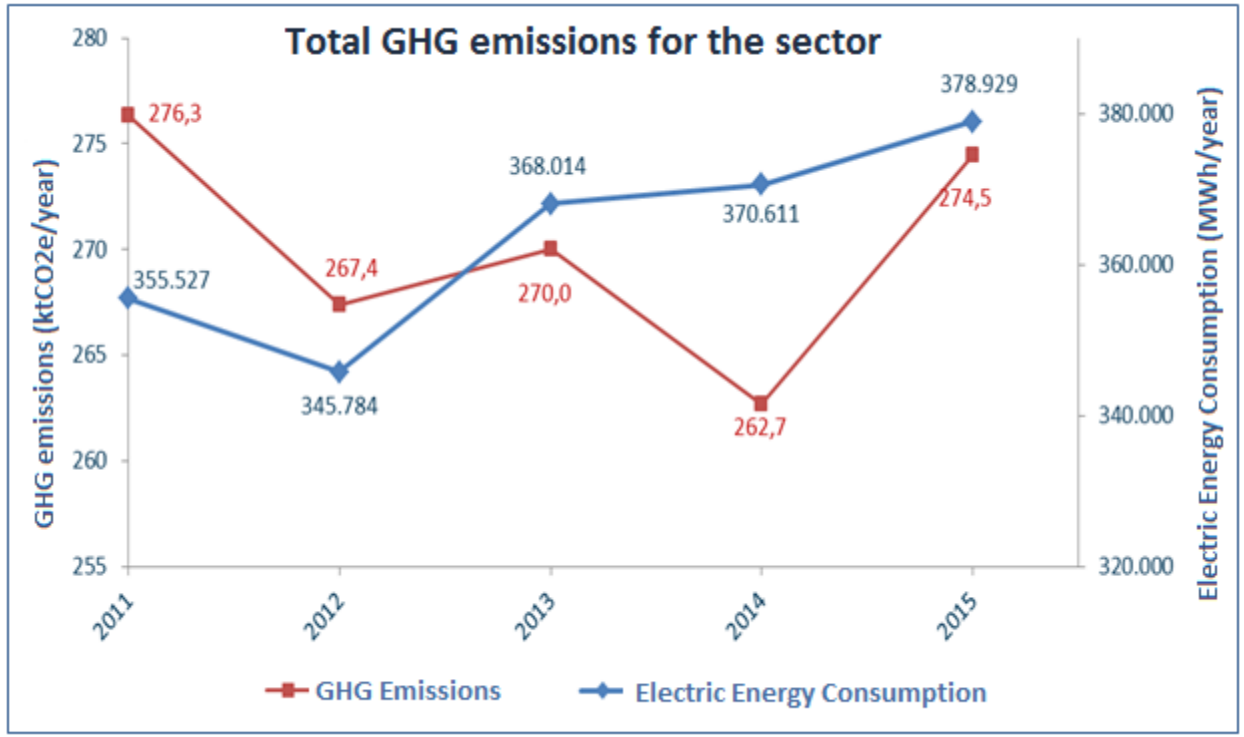
NAMA: Energy Efficiency in Public Buildings in El Salvador

- **Geographical scope:** The entire country of El Salvador (approximately 20,742 km2).
- **Sector:** Public government buildings, including 7,255 buildings.
- **Branches of government:** 14 branches considered.
- **Time Frame: 2018-2025.** Aligned with NDC.
- **Technologies:** energy efficiency on building equipment, focusing on the replacement of air conditioning equipment, lamps and electric motors.
- **Approach for implementation:** mechanism oriented to the public sector
- **Energy Efficiency Committees (COEEs)** and building managers / operators.

The elaboration of the NAMA required a detailed analysis from a technical, institutional and economic viewpoint.

Historical Measurements of Electricity Consumption and GHG Emissions





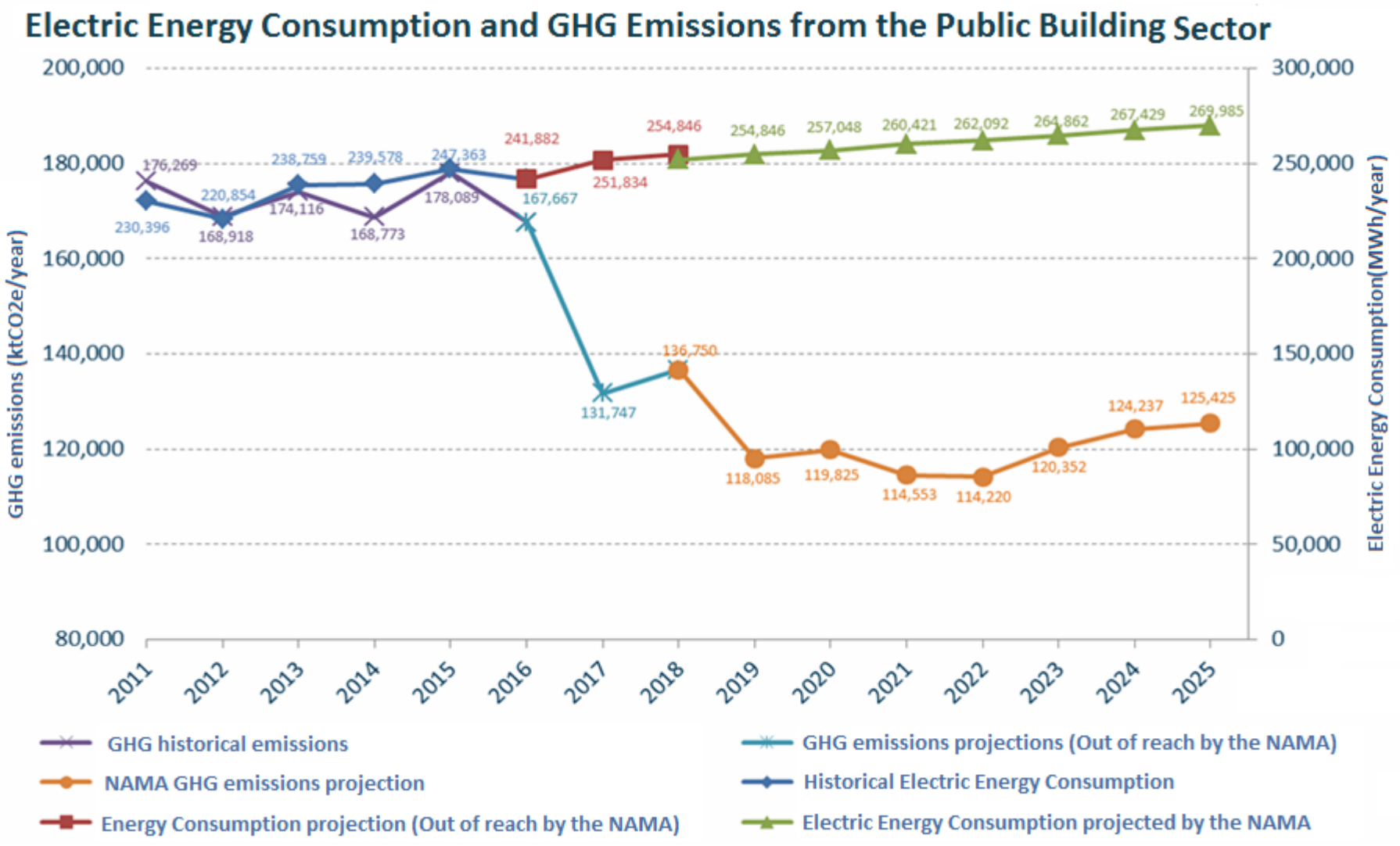
Assumptions

- The trend of the last 5 years remains.
- Projections according the document “Actualización del Plan Indicativo de la Expansión de la Generación 2014 – 2024” of the CNE.
- Constant value in transmission losses 7.8 %.

NAMA Implementation Projections

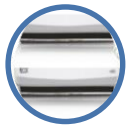
Electric Grid Emission Factor (TCO2eq / MWH)

Year	Factor
2011	0.68
2012	0.69
2013	0.68
2014	0.65
2015	0.67
2016	0.64
2017	0.49
2018	0.50
2019	0.43
2020	0.43
2021	0.41
2022	0.4
2023	0.42
2024	0.43
2025	0.43



Mitigation Actions

Direct actions



Air Conditioning

Minisplit and Windows **(55 %)**

Lighting: interior and outer

(24 %)

Electric Motors

(6 %)

Indirect actions

Institutionals

- Board of Governance
- Extent of scope reported data COEES
- Increased number of COEEs

Sensitization and Training

- Sensitization campaigns and EE training sessions for public buildings users

Regulations

- Ratify and implement the "EE Regulation Code" developed under the EEPB project
- Introduce minimum EE standard for public sector

technical

- Implementation of complementary measures such as temperature regulation and optimization of the use of lighting

Energy Savings due to NAMA Implementation

Establishment of results through 2 Scenarios of the NAMA:

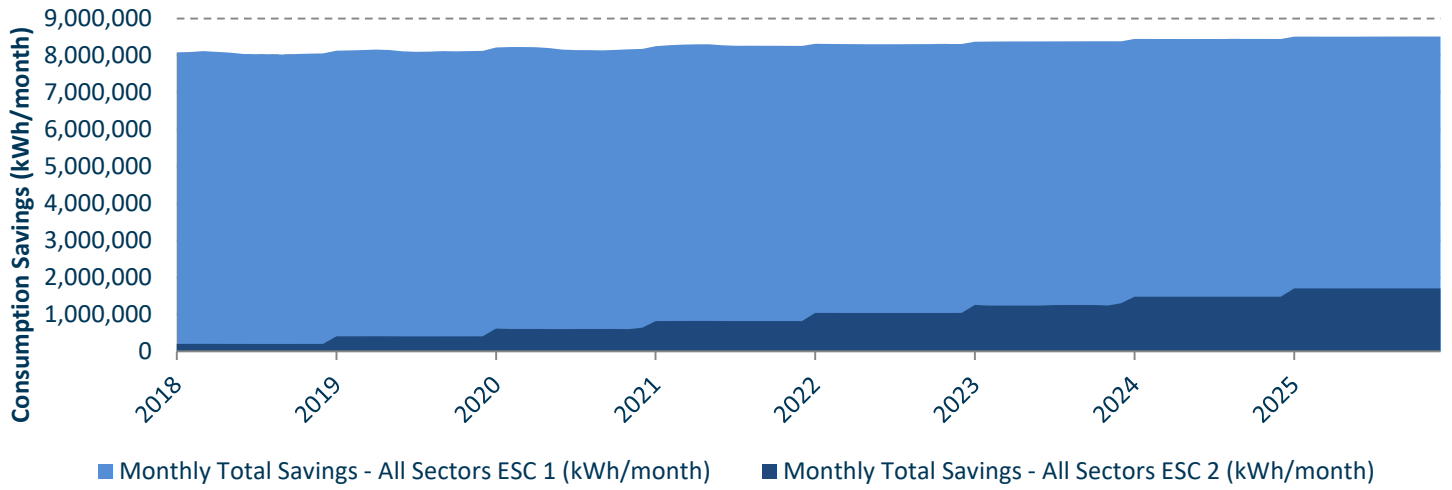
Scene 1
Replacement of 100% of the equipments since January 2018.

Scene 2
Gradual replacement of 2.5% per year of equipment from 2018

Current technology	Replacement technology	Energy Savings %
Air conditioning		
10 SEER Mini Split AC	16 SEER Mini-Split Inverter (12,000btu/h)	35%
7 SEER AC (window unit)	13 SEER Mini-Split Inverter (12,000btu/h)	40%
Lighting		
Linear Fluorescent: T12 4x40W	T8 2x32W (plus reflectors)	65%
Linear Fluorescent: T8 3x32W	LED 2x18W	70%
High-intensity discharge lamps: Metal Halide 400W	LED Outdoor 120W	70%
High-intensity discharge lamps: Mercury vapor 175W	LED Outdoor 100W	60%
High-intensity discharge lamps: Sodium vapor 250W	LED Outdoor 120W	50%

Energy Savings Due to the NAMA Implementation

Electricity Savings of the Sector

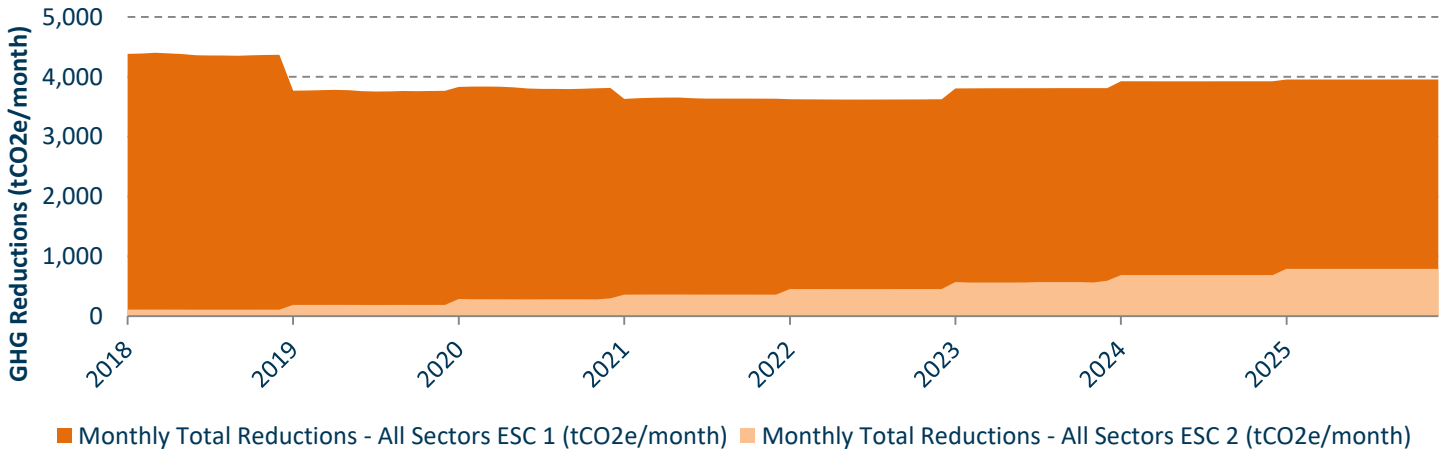


Comulative 2018-2025

Case 1
796 GWh

Case 2
90 GWh

GHG Reduction of the Sector



Comulative 2018-2025

Case 1
371 ktCO2e

Case 2
41 ktCO2e

NAMA Implementation Costs

The analysis includes:

- Investment cost
- Installation Cost
- Maintenance costs

Total cost:

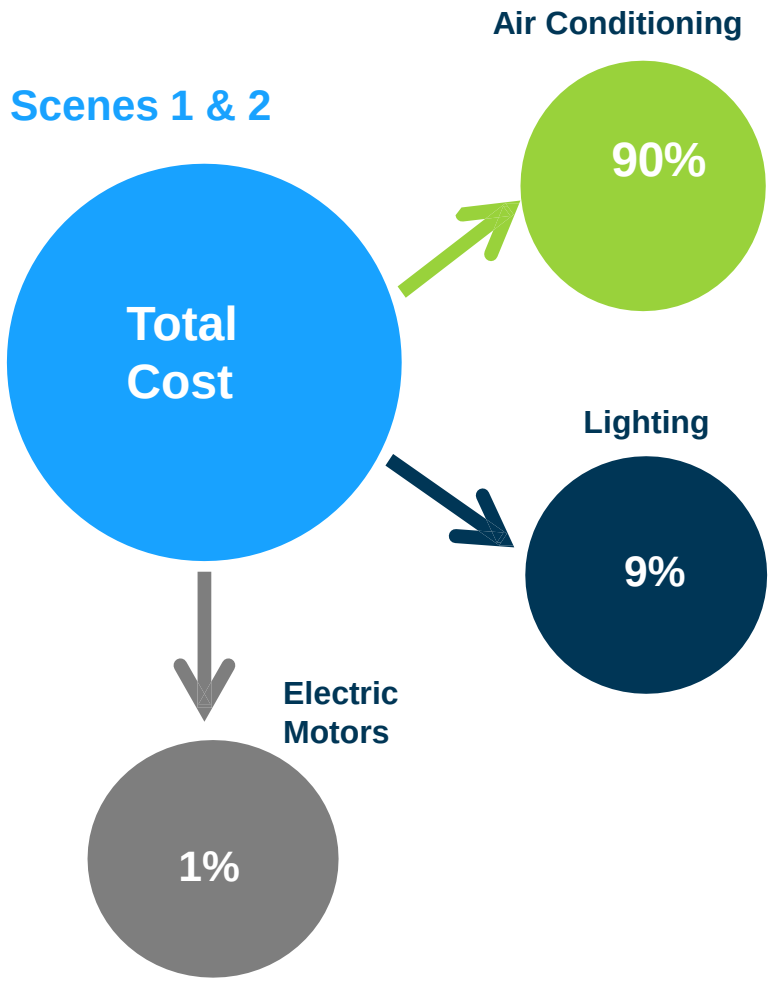
- **Scene 1: 157 Million USD**

  Replacement of 100% of the equipment since January 2018.

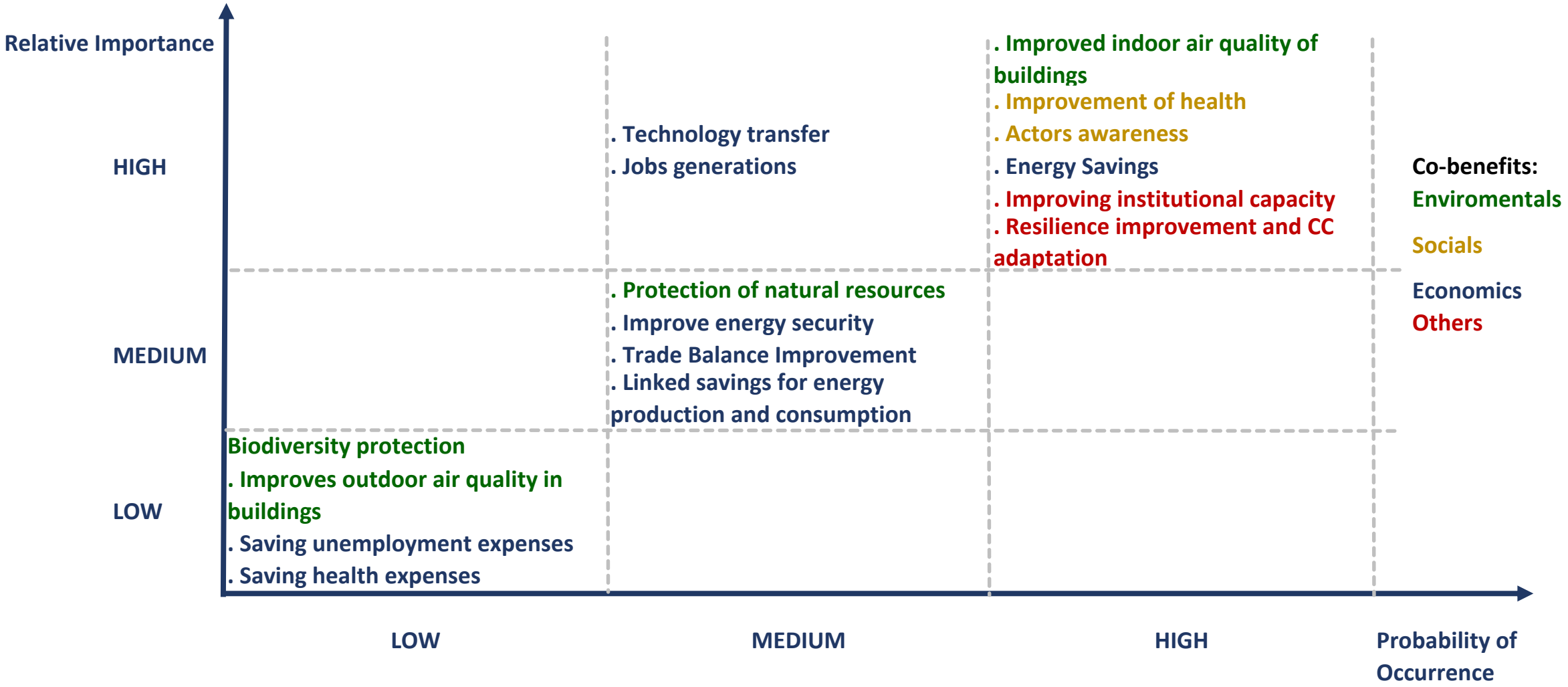
- **Scene 2: 31 Million USD**

  Gradual replacement of 2.5% per year of equipment from 2018.

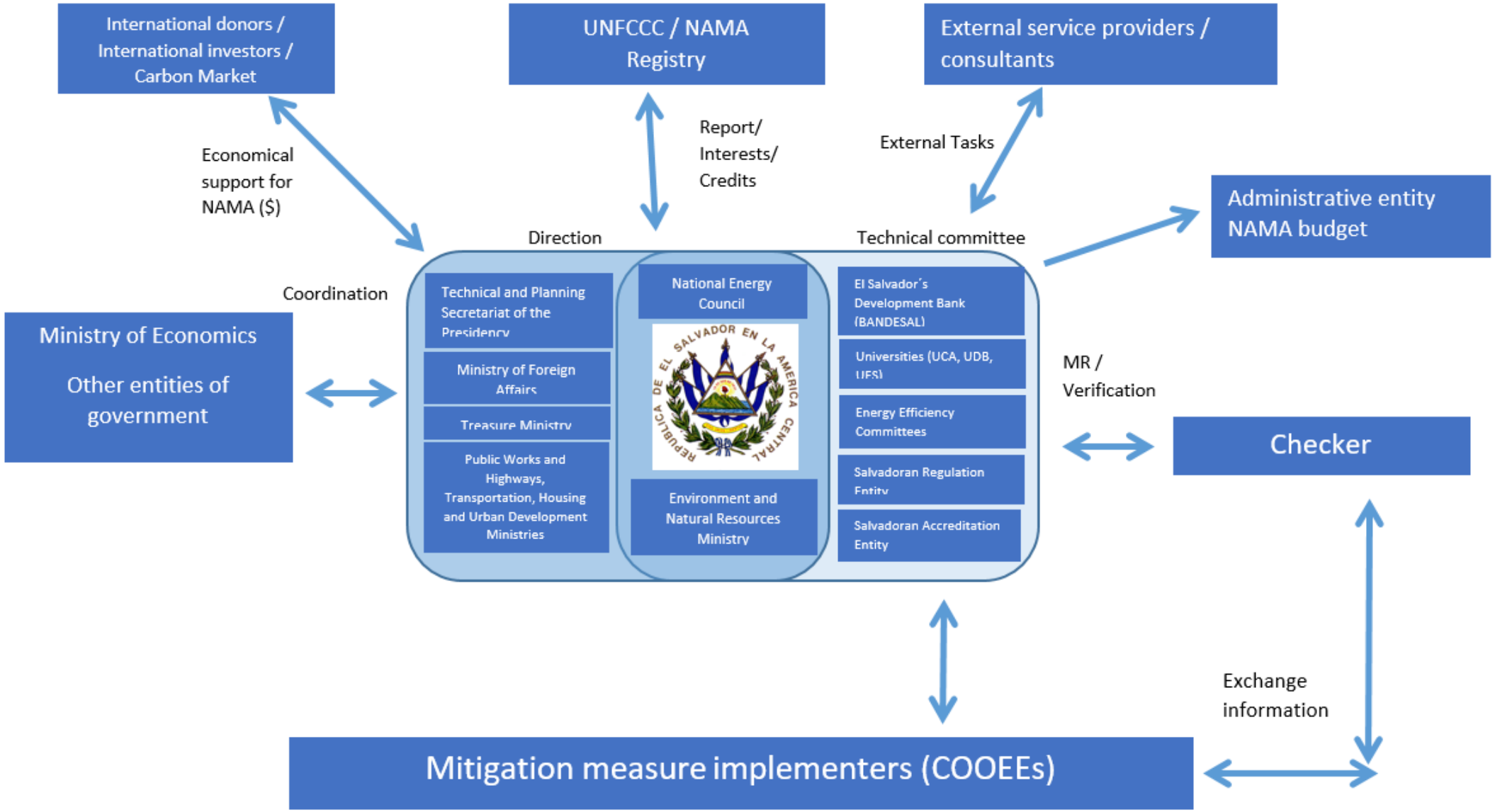
  NAMA Facility has been requested to supplement 16 Million USD .



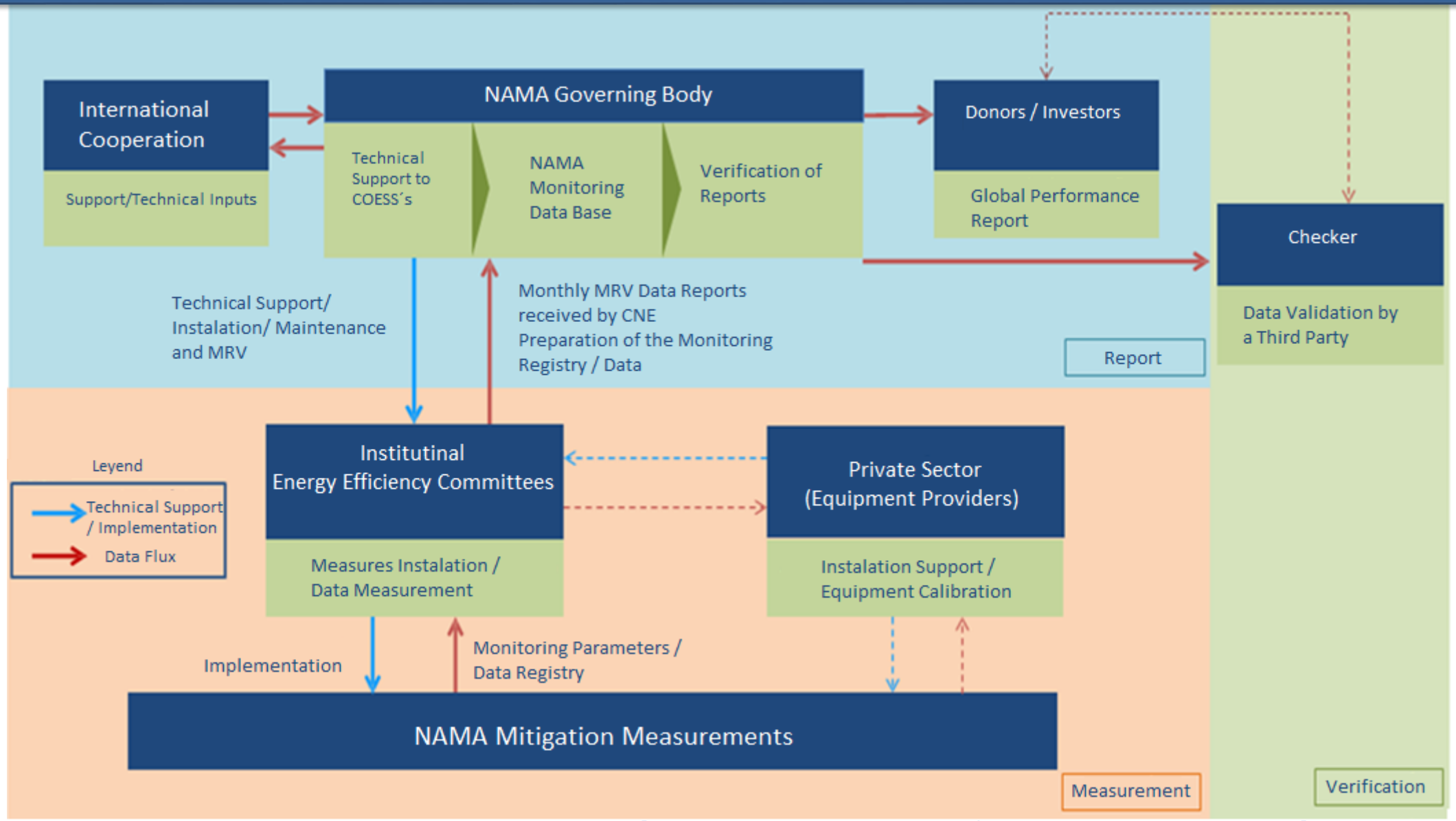
Co-benefits of NAMA Implementation



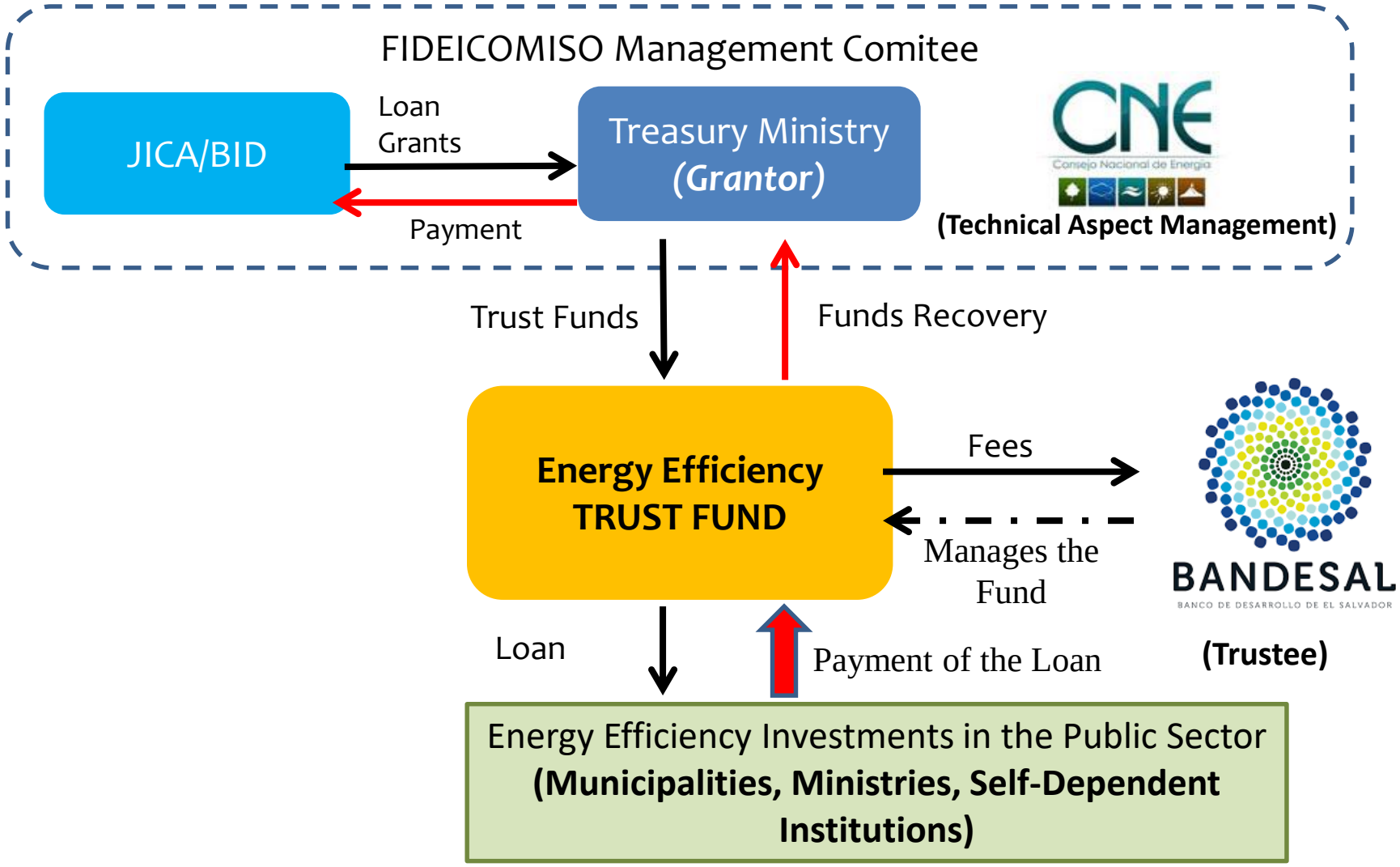
Interaction of the Governing Board



General MRV Scheme



NAMA Complements. Government investment



THANK YOU

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