

Phasing out Inefficient Refrigerators in the Sri Lanka Market

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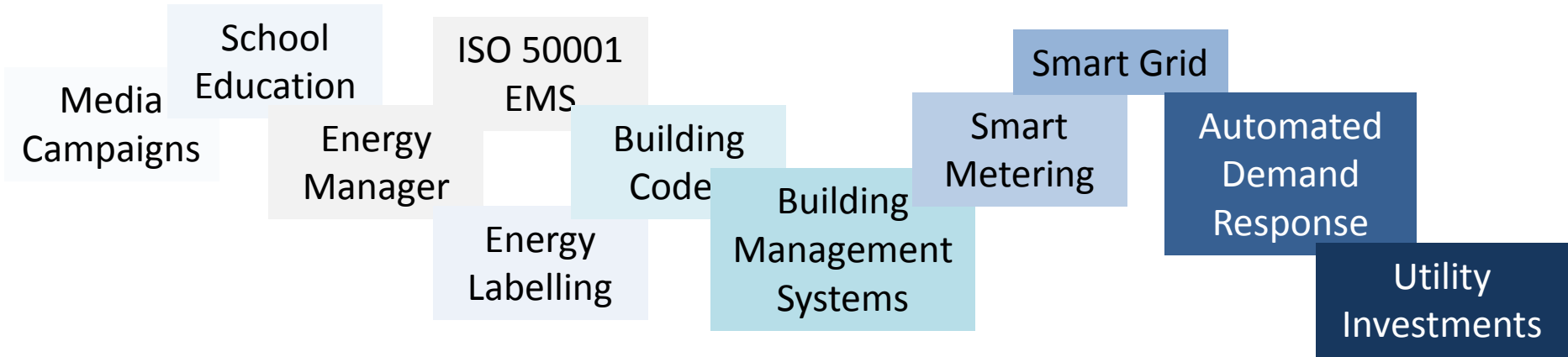
Executive

Sri Lanka Sustainable Energy Authority



The Current Situation

- The country is facing an energy crisis
- Have we got answers?
 - Yes, centrally driven hard solutions
 - Soft solutions with public engagement



Easy to implement
Low cost
Low response
Low returns

Difficult to implement
High cost
Certain response
Predictable returns

SOFT

HARD

The DSM Vision

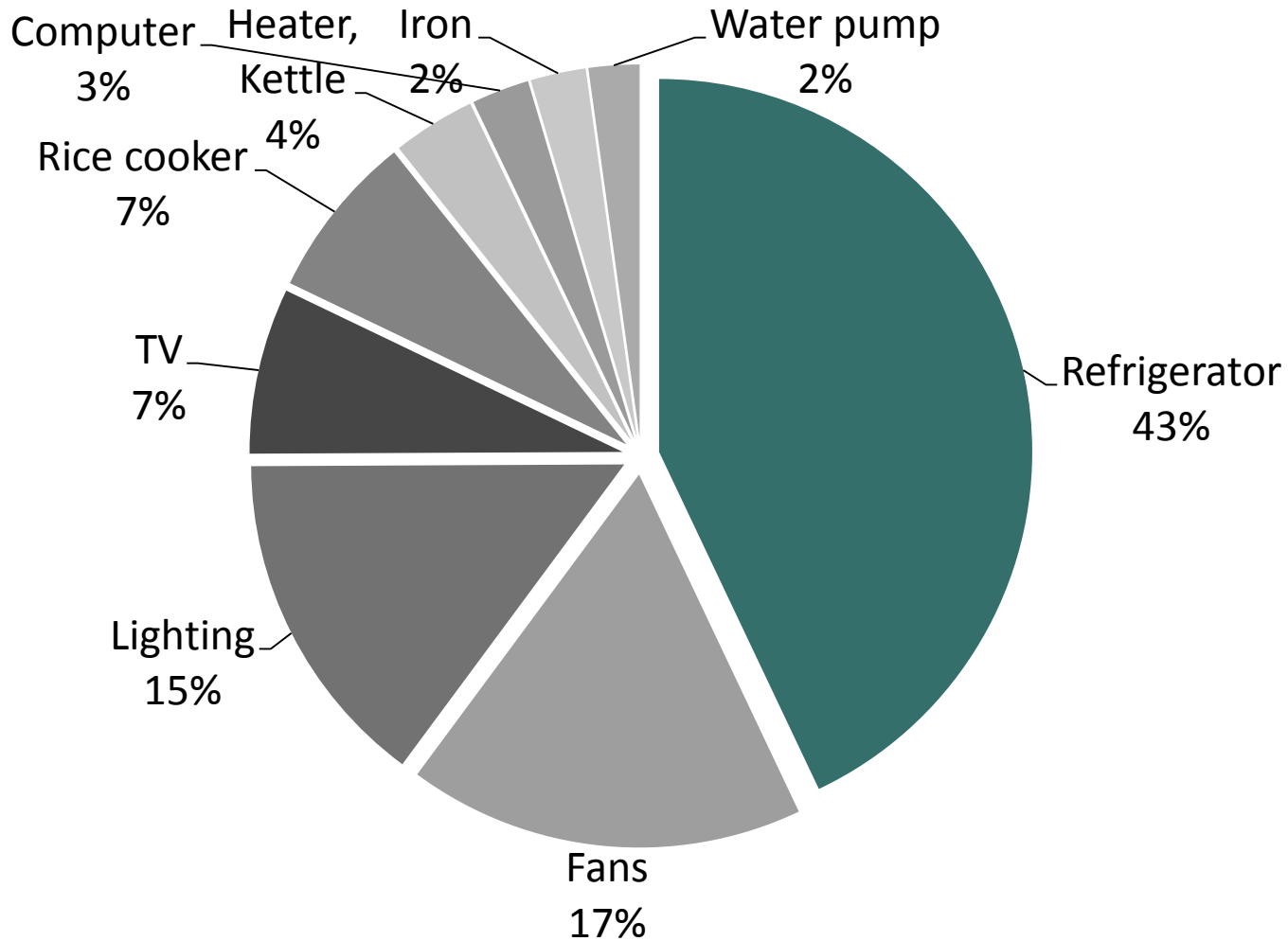
- A long term programme was formulated for 2016-2020
- Save 1,895 GWh of Electricity in 2020
- Avoid 471 MW of Electricity Generation Capacity in 2020
 - Interventions in...
 - Domestic sector
 - State sector
 - Industries
 - Commercial sector

Dealing with large volume end

- Appliance control
 - All popular appliances to go under a MEPS
 - Labelling programme to follow
 - Green procurement and circulars on energy efficiency
- Market interventions
 - Differential taxation (based on appliance efficiency)
 - 'Trade in' schemes to remove obsolete stock
 - Soft finances to buy better equipment
- Implementation vector – SEA
 - Supported by affiliate institutes (SLSI, NERD, Customs)
 - Networked with vendor groups (co-brand)

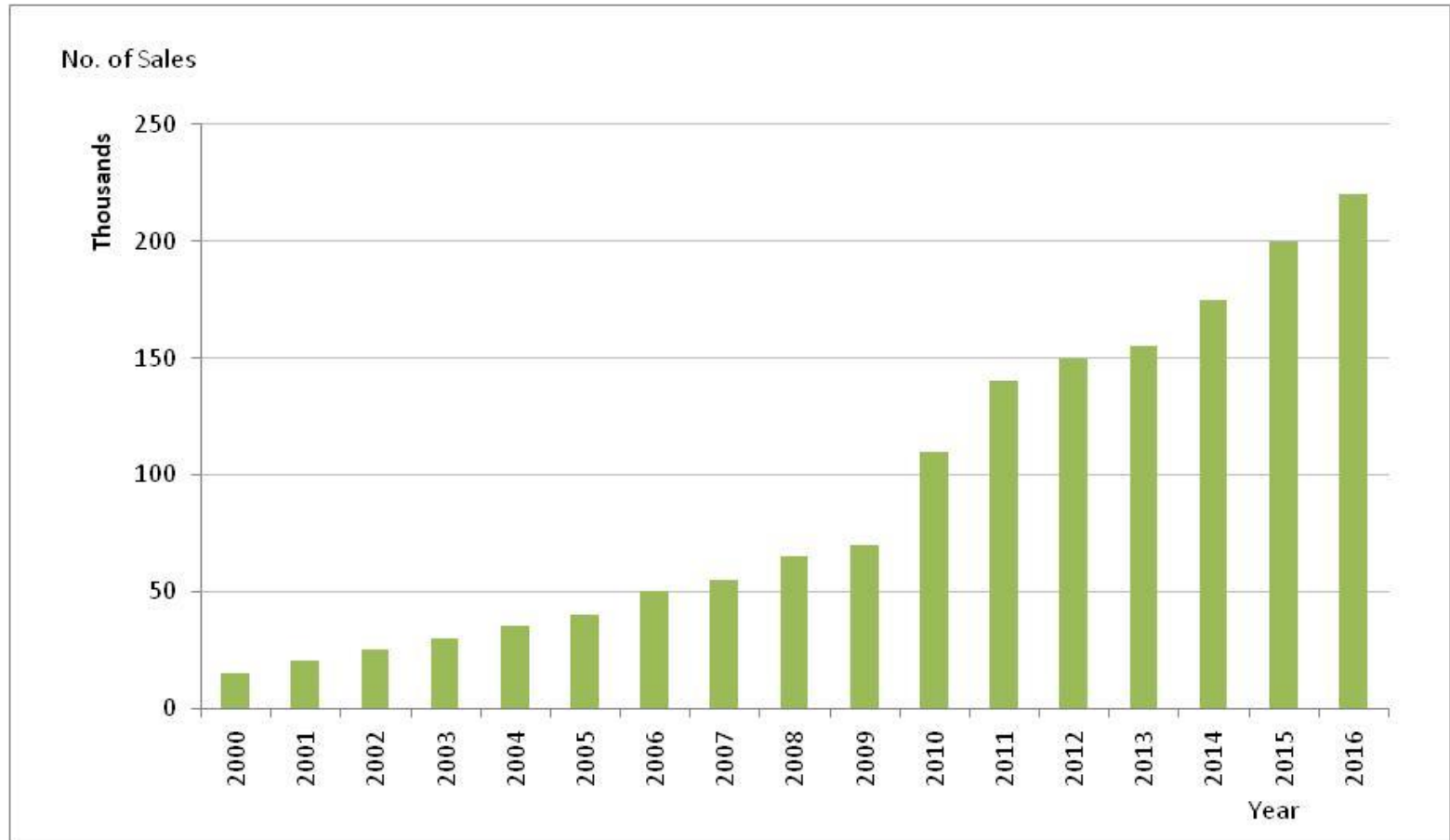
	Technology Intervention	Annual Saving (GWh)	Investment (LKRM)	Grants (LKRM)	Debt (LKRM)	Programme Cost (LKRM)
1	Efficient Air Conditioning (Commercial, Industrial, Government)	84	5,451		5,451	195
2	Efficient Lighting (Government, Commercial, Industrial)	250	9,510		9,510	100
3	Efficient Refrigerators (Domestic)	161	24,551	6,138	18,413	
4	Efficient chillers (Industrial, Commercial, Government)	41	11,075		11,075	166
5	Efficient Motors & VSDs (Tea Sector)	86	6,393		6,393	105
6	Eliminating Incandescent Lamps (Domestic)	139	415		415	
7	Efficient Fans	298	17,671	8,836	8,835	5
8	Green Building (Commercial, Industrial)	43	22,586	3,388	19,198	276
	Total	1,104	97,652	18,776	78,876	847

Energy Balance of a Household



Refrigerators in residences – 3.3 million (estimated)

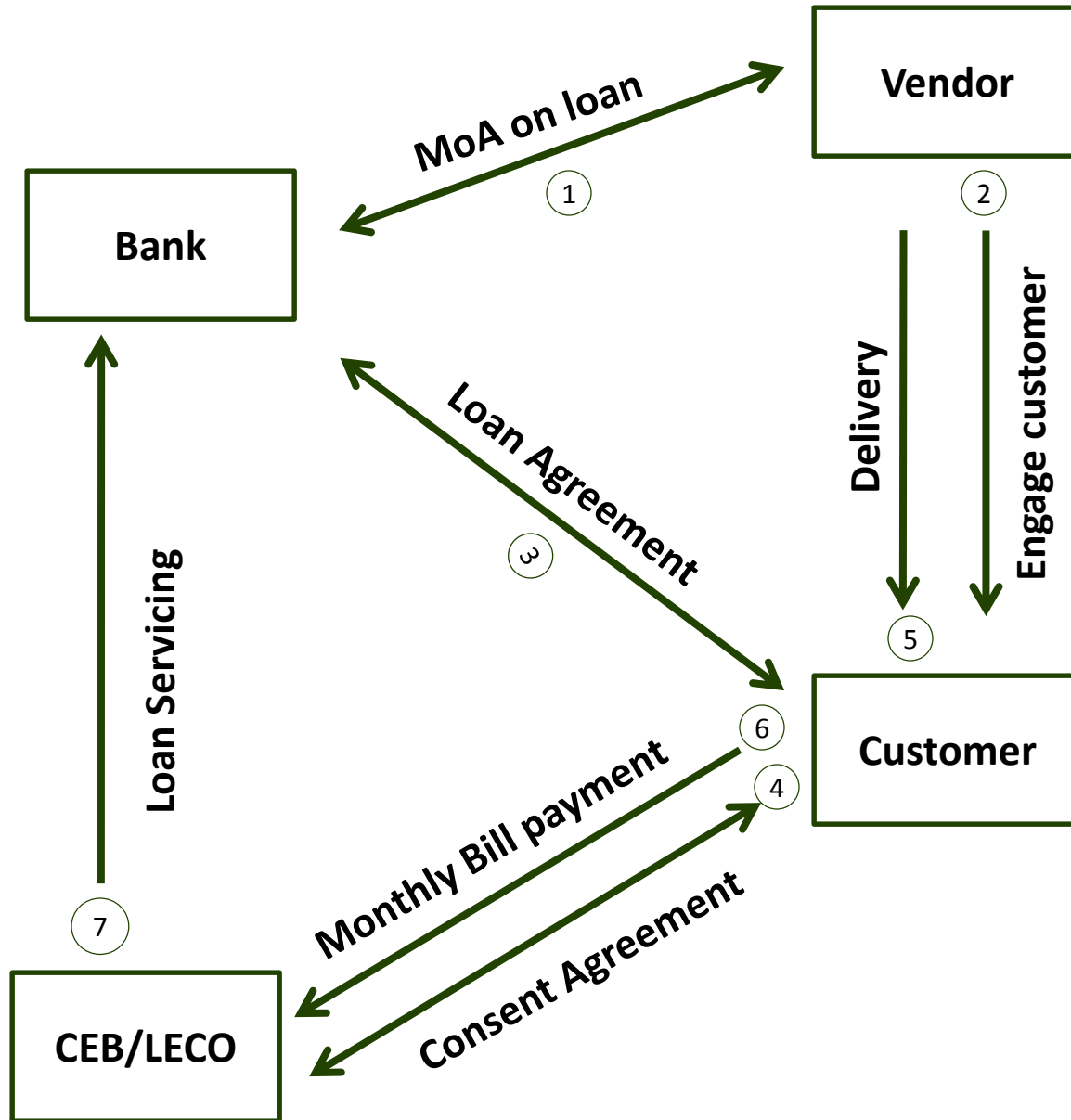
Penetration



- Penetration Level – 60%
- Average sales in 2016 – 250,000

Programme Implementation

Process Flow



What we considered

- If this scheme is implemented, what are the likely benefits..?
 - To the utility?
 - To the country?
 - To the customer?
- Evaluation conducted through multiple perspectives

Typical cases we considered

Capacity (litres)	Monthly consumption of the ref (kWh/month)		Total monthly saving (kWh/month)	Investment (USD)
	before replacement	after replacement		
190	65	39	26	262
240	95	57	38	426

Parameters

Category	No. of Residences	# of units distributed per category	Total investment (USD million)	Energy saving after replacement (kWh/month)	Energy saving after replacement (GWh/yr)
60 - 120	2,054,647	81,741	16	26.0	25.5
120 - 180	458,965	18,259	6	38.0	8.3
Total	2,513,612	100,000	22	64	34

- Projected saving after 5 years of the programme is 163 GWh

A win-win-win solution

Customer

	190 litre	250 litre
NPV	159.9	387.85
IRR	39%	57%

Utility

NPV	78.0 USD M
IRR	120%

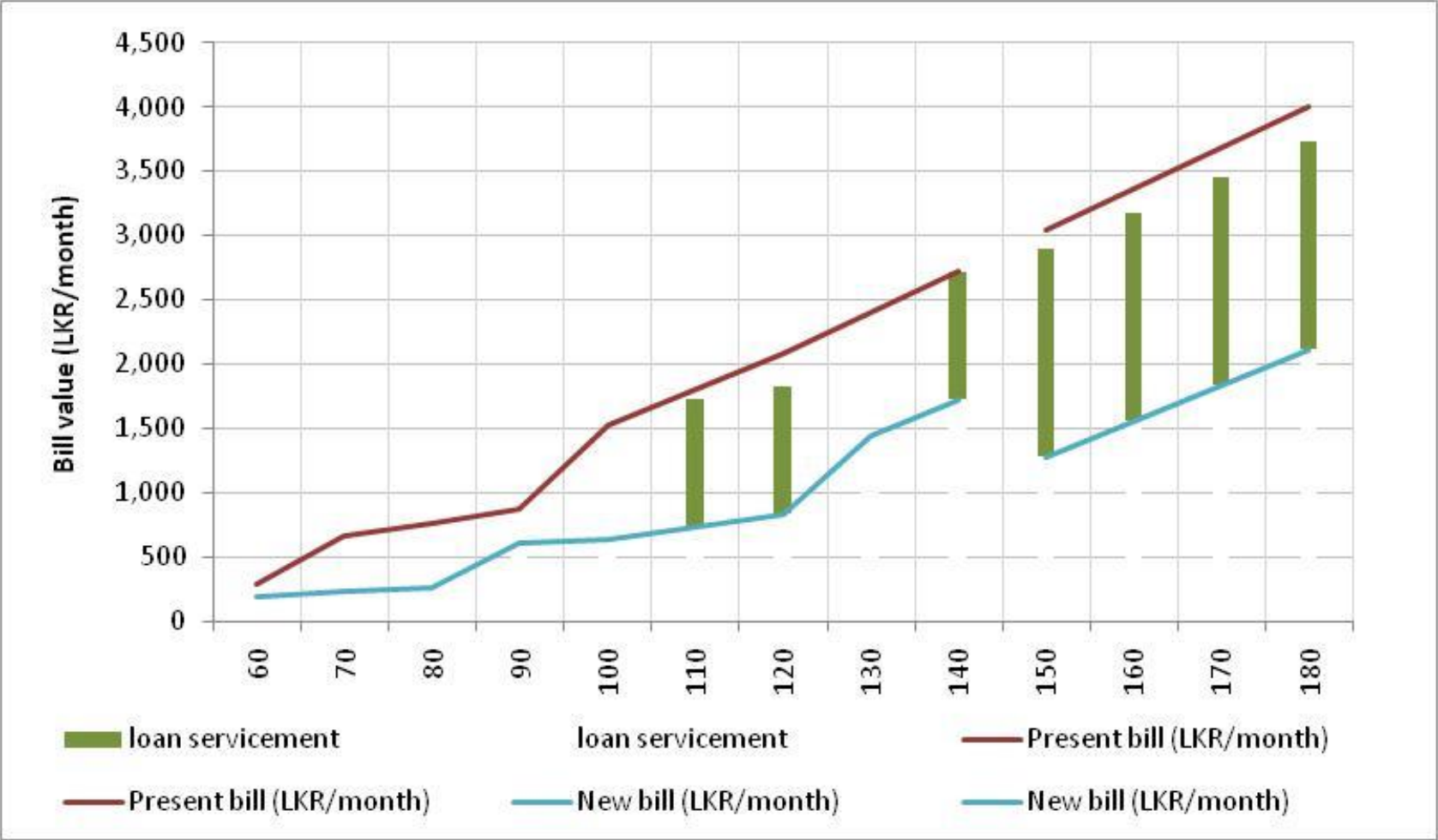
Sri Lanka (Taxation not Considered)

NPV	0.34 USDM
IRR	10%

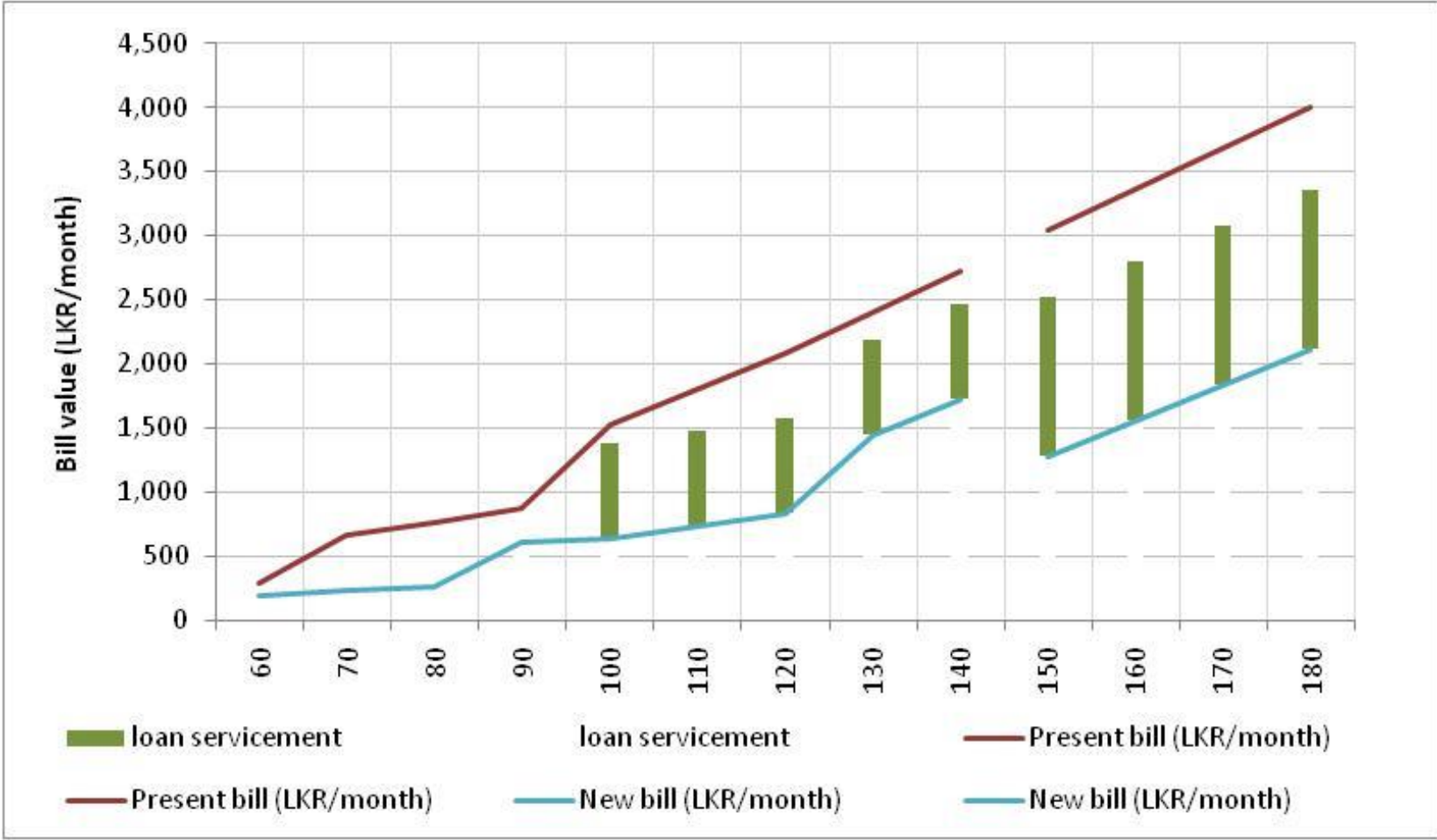
Bill savings

- Bill savings

Bill savings



Bill savings



Thank you!