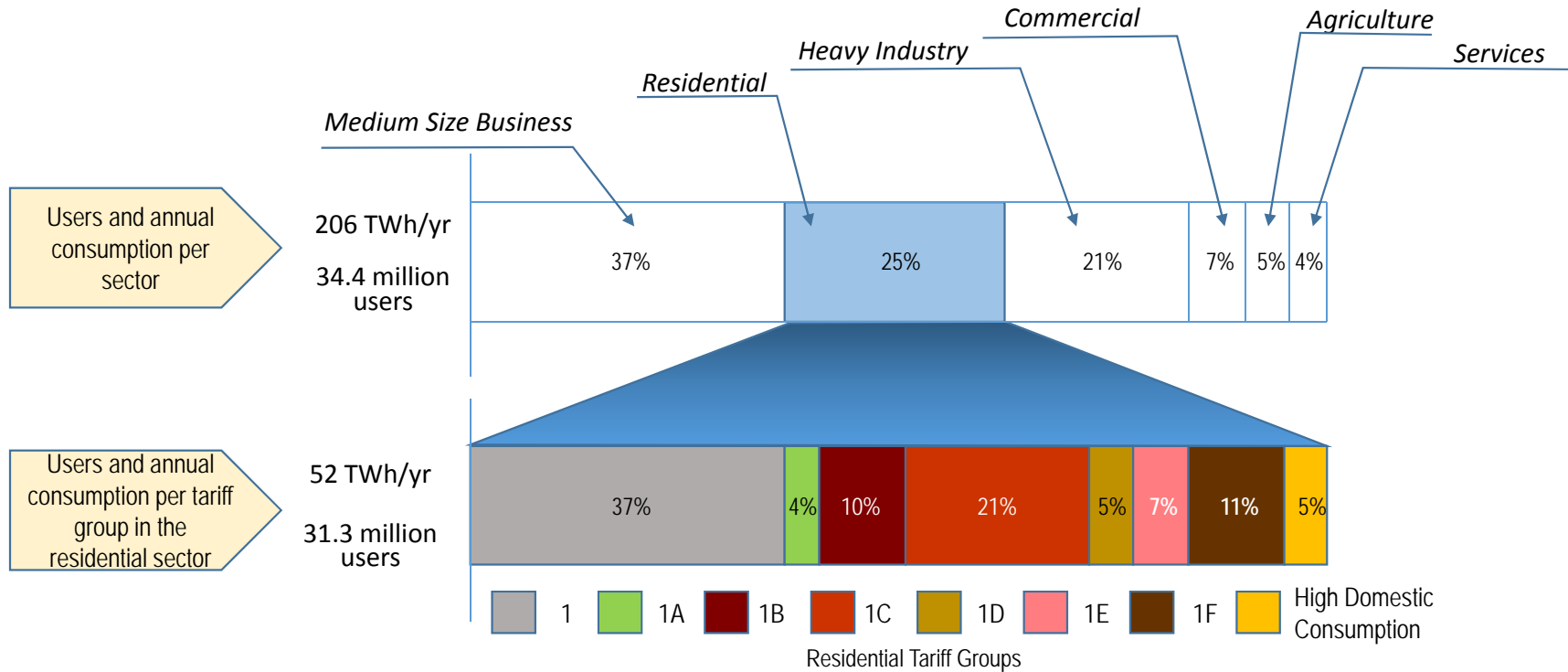


LARCI
MEXICO, A.C.

Latin America Regional Climate Initiative

REFOCUSING SUBSIDY TO SOLAR DISTRIBUTED GENERATION

Electricity Tariffs in the Residential Sector in Mexico



Electricity Consumption by Sector and Tariff Grouping as for 2013

Sources: SIE, BIE, PwC Analysis

6. Tarifas Domésticas: Subsidios



- Existen subsidios directos a las tarifas de electricidad.
- El mayor subsidio es para las tarifas domésticas de consumos bajos e intermedios.
- Los usuarios domésticos de alto consumo (DAC) no tienen subsidio.
- Tampoco hay subsidio para los usuarios comerciales e industriales.

Subsidies for Residential Sector
(MXN pesos)

Tarifas	VENTAS GWh	PRODUCTOS mil. \$	PRECIO MEDIO \$/MWh	COSTOS mil. \$	COSTO MEDIO \$/MWh	SUBSIDIO mil. \$	RELACIÓN PRECIO/COSTO
Domésticas							
1	18,916	20,656	1,092	59,348	3,139	38,728	0.348
1A	2,119	2,089	986	6,548	3,093	4,459	0.319
1B	5,108	5,177	1,014	14,309	2,801	9,132	0.362
1C	10,850	11,887	1,096	27,894	2,571	16,007	0.426
1D	2,914	3,105	1,066	7,412	2,543	4,307	0.419
1E	3,384	3,108	919	8,427	2,490	5,318	0.369
1F	5,681	5,044	888	13,740	2,419	8,695	0.367
DAC	2,799	9,531	3,405	6,750	2,411		1.412
Comerciales							
2	11,663	32,403	2,778	29,210	2,505		1.109
3	1,907	4,585	2,404	4,288	2,249		1.069
7	21	89	4,259	64	3,064		1.39
Servicios							
5	876	2,364	2,698	1,683	1,921		1.404
5A	3,991	8,666	2,171	9,146	2,292	496	0.947
6	3,200	4,815	1,505	6,540	2,044	725	0.736
Agrícolas							
9	78	109	1,395	236	3,012	127	0.463
9M	976	1,355	1,389	1,688	1,730	459	0.803
9CU y 9N	9,919	4,575	461	16,644	1,678	12,070	0.275
Mediana Industria							
OM's	13,183	24,430	1,853	22,148	1,680		1.103
HM's	60,249	90,415	1,501	89,831	1,491		1.007
Gran Industria							
HS's	25,280	32,713	1,294	30,735	1,216		1.064
HT's	17,832	19,724	1,106	19,211	1,077		1.027
TOTAL	200,946	286,843	1,427	375,889	1,871	101,522	0.763

Annual Subsidy, million MXN\$								
1	1A	1B	1C	1D	1E	1F	Todas	B+C+D+E+F
38,724	4,459	9,132	16,007	4,307	5,319	8,696	86,680	43,461
Subsidized Households								
17,658,904	1,881,722	3,574,618	4,952,862	1,100,986	1,040,374	1,190,172	31,399,638	11,859,012

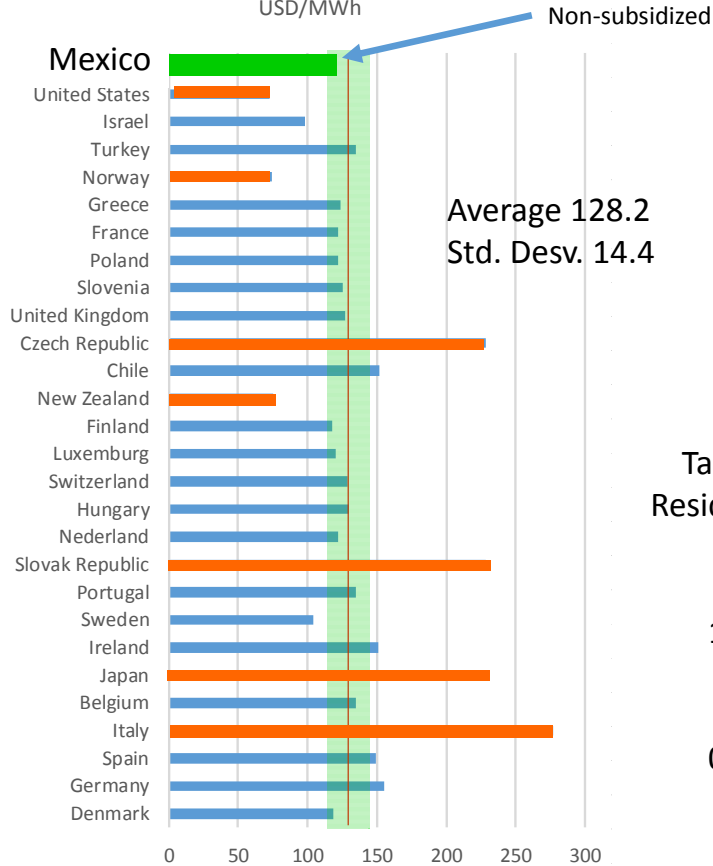
<http://www.cnnexpansion.com/economia/2013/12/19/el-subsidio-a-la-luz-reta-a-la-reforma>
citing a report from Bank of America-Merrill Lynch

Presentation by CFE's General Director, Jaime González Aguadé, before the Senate' Energy Comm., Oct 2012 http://www.senado.gob.mx/comisiones/energia/docs/doc_CFE.pdf

Fuente: CFE

Mexico's Residential Subsidy is the Biggest Among OECD

Non-Residential Electricity Price, OECD
USD/MWh

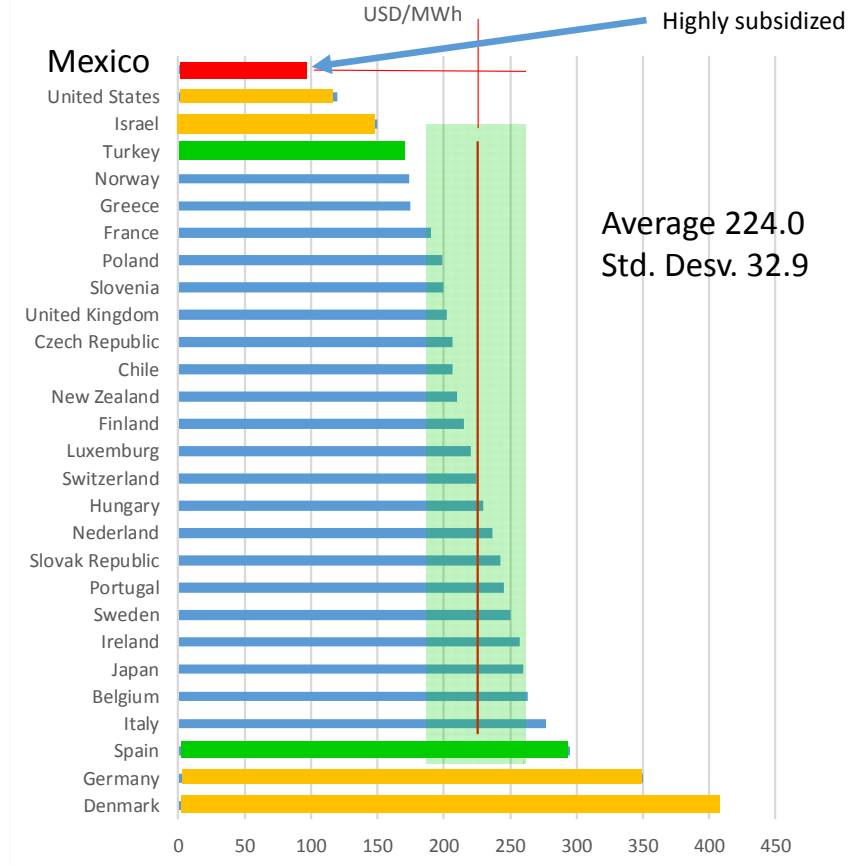


Tariffs Ratio
Resid/Non-resid

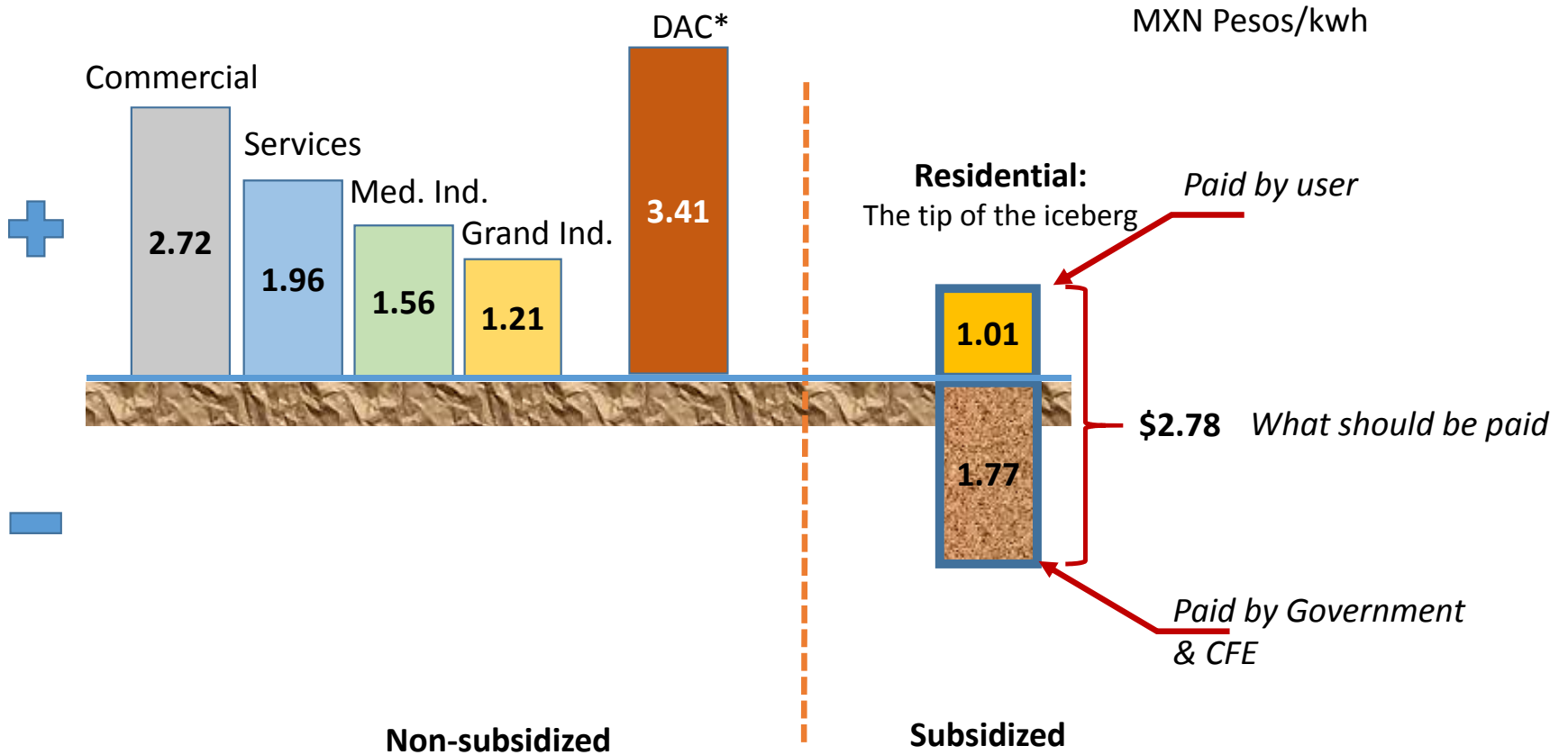
OECD
1.7 : 1.0

Mexico
0.8 : 1.0

Residential Electricity Price, OECD
USD/MWh

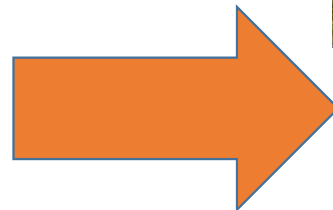


Subsidy Is Not For Free



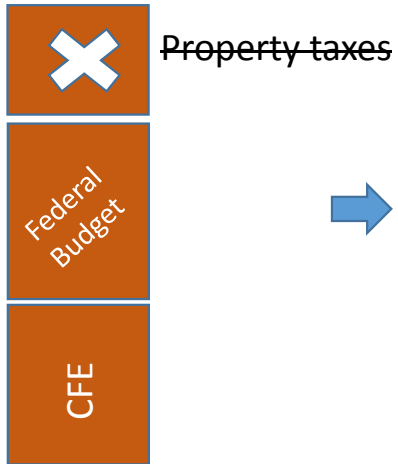
*High domestic consumption

Subsidy money for solar rooftops
Houses with solar rooftops do not need subsidy

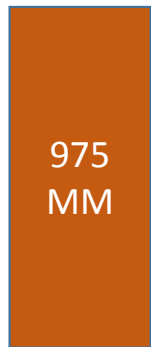


Es posible eliminar el subsidio y bajar los precios en un horizonte de 15 años

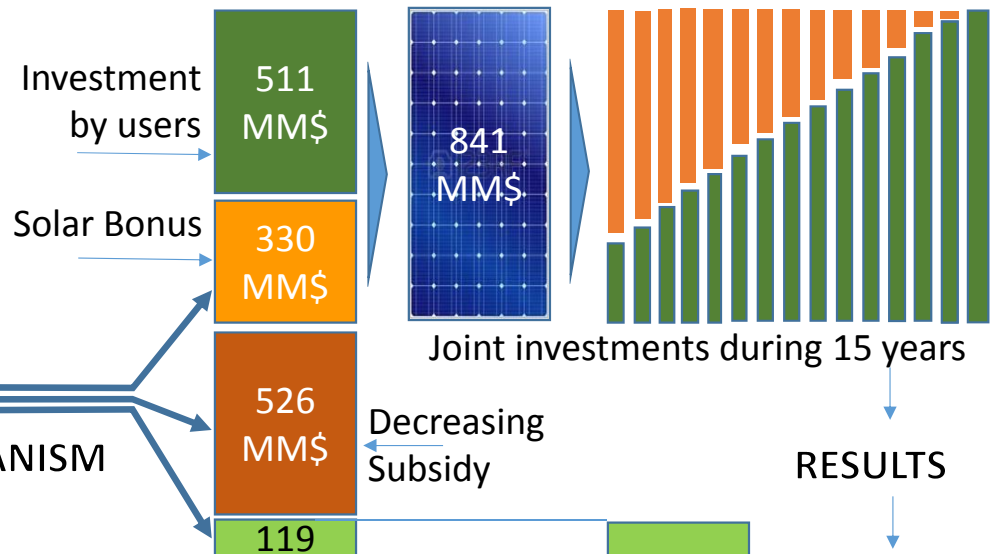
Before:
86 MM\$ x 15 years =
1,300 MM\$*



Now:
~65 MM\$ x 15 years =
975 MM



SUBSIDY



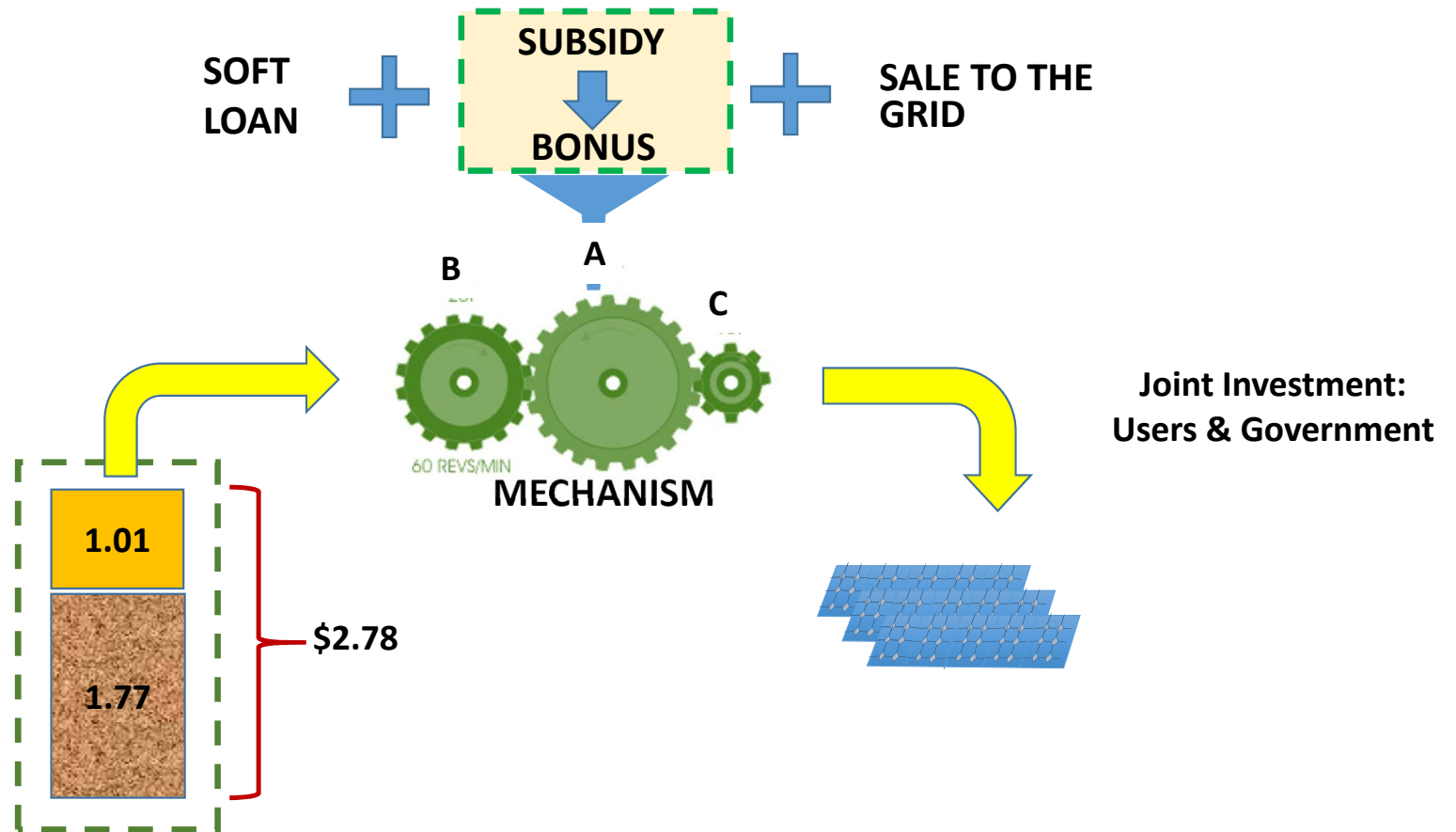
RESULTS

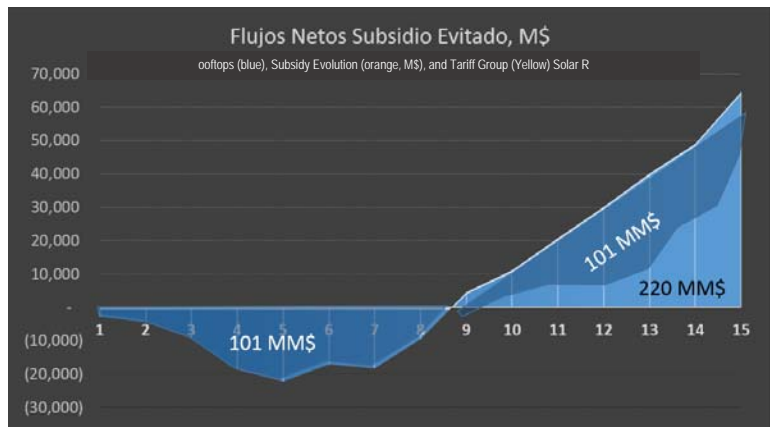
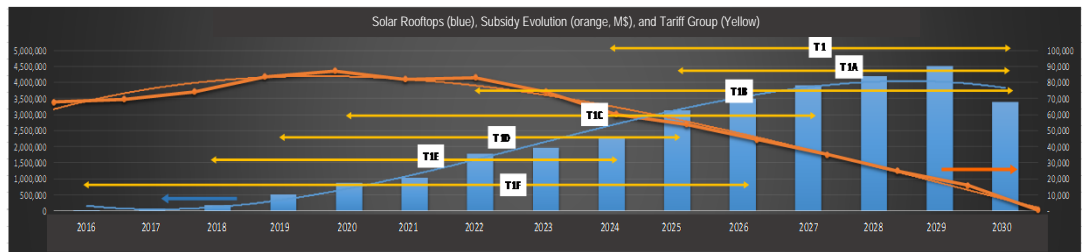
Money freed during the next 15 years period beginning at year 16th.
65 MM\$ x 15 = 975 MM\$



*MM = Thousand million Mexican pesos

Se requiere un Mecanismo para la Participación de los Usuarios





Residential Sector Facts



Total Electricity Subsidy, 2013

\$7.14 BN USD (100 BN Mx
Pesos)

Residential Subsidy, 2013

\$6.0 BN USD (84 BN Mx pesos)

Number of Subsidized Residential Users

31.4 million

National Subsidized Residential Consumption

52 TWh/yr

Focusing the Mechanism on Highly Subsidized Tariff Groups

1. Higher temperature zones
2. Highest solar radiation zones.
3. Solar peak coincides with early afternoon demand peak
4. Households are one-family and have flat roofs



Distributed Generation Proposal

Focus on Tariff Groups 1B – 1F

Goal by 2024:

25 GW peak

Total Generation by 2024:

40 TWh/yr

Benefited Users:

11.6 million (out of 31 million, 35%)

Present Subsidy:

43.4 M\$ (3.1 B US Dlls)

PV Rooftop Capacity:

1,500 - 3750 W (Actual equivalent capacity is 960 W)

Generation per Rooftop:

2,365 – 5,320 kWh/yr (Actual consumption is 1,560 kWh/yr)

Surplus Generation for Selling:

936 – 1,140 kWh/yr

Selling Price to Grid (90% of generation cost): \$0.12 USD kWh

Installation Cost @ 2016:

2.4 – 3.2 US Dlls/watt

Installation Cost @ 2024:

1.0 – 2.0 US Dlls/watt

Service life:

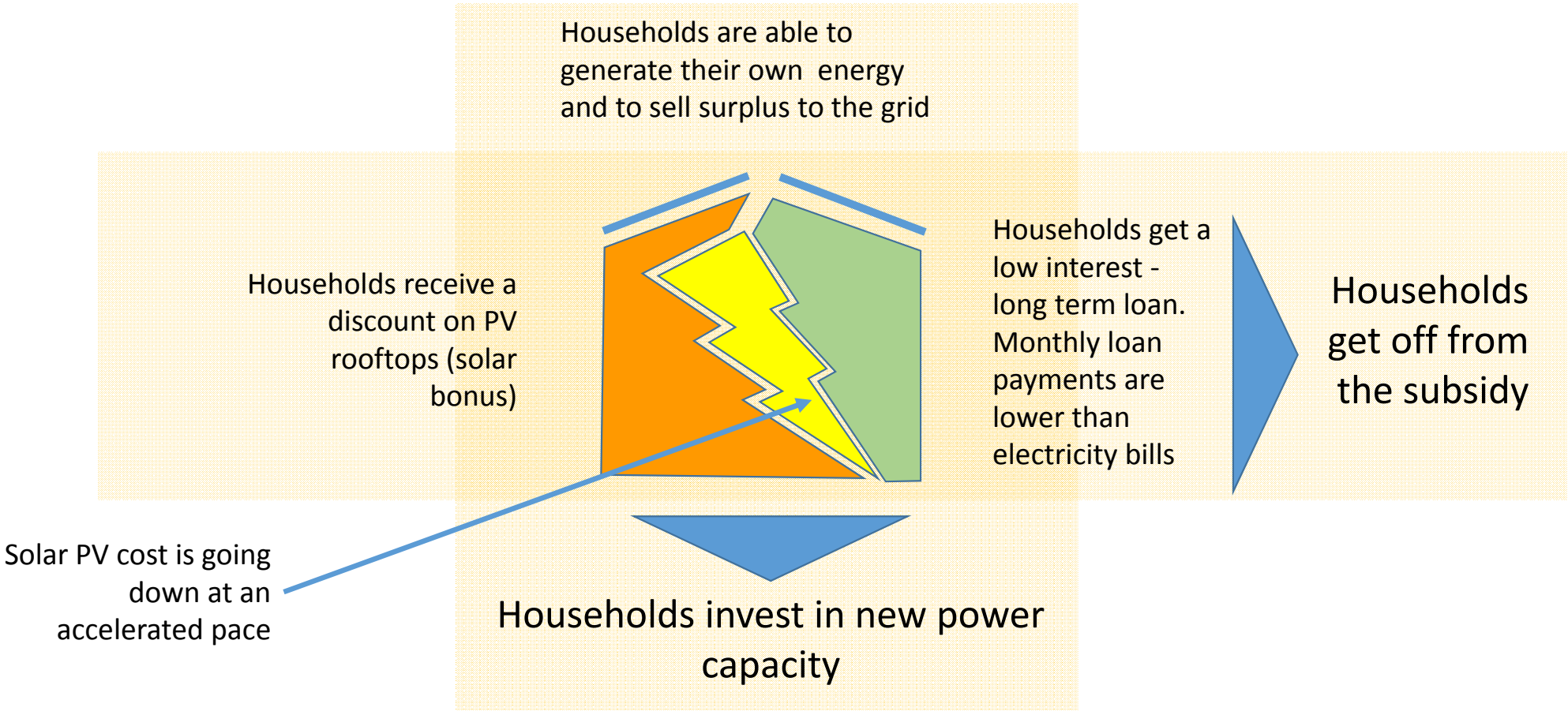
+ 20 yr

Plant factor:

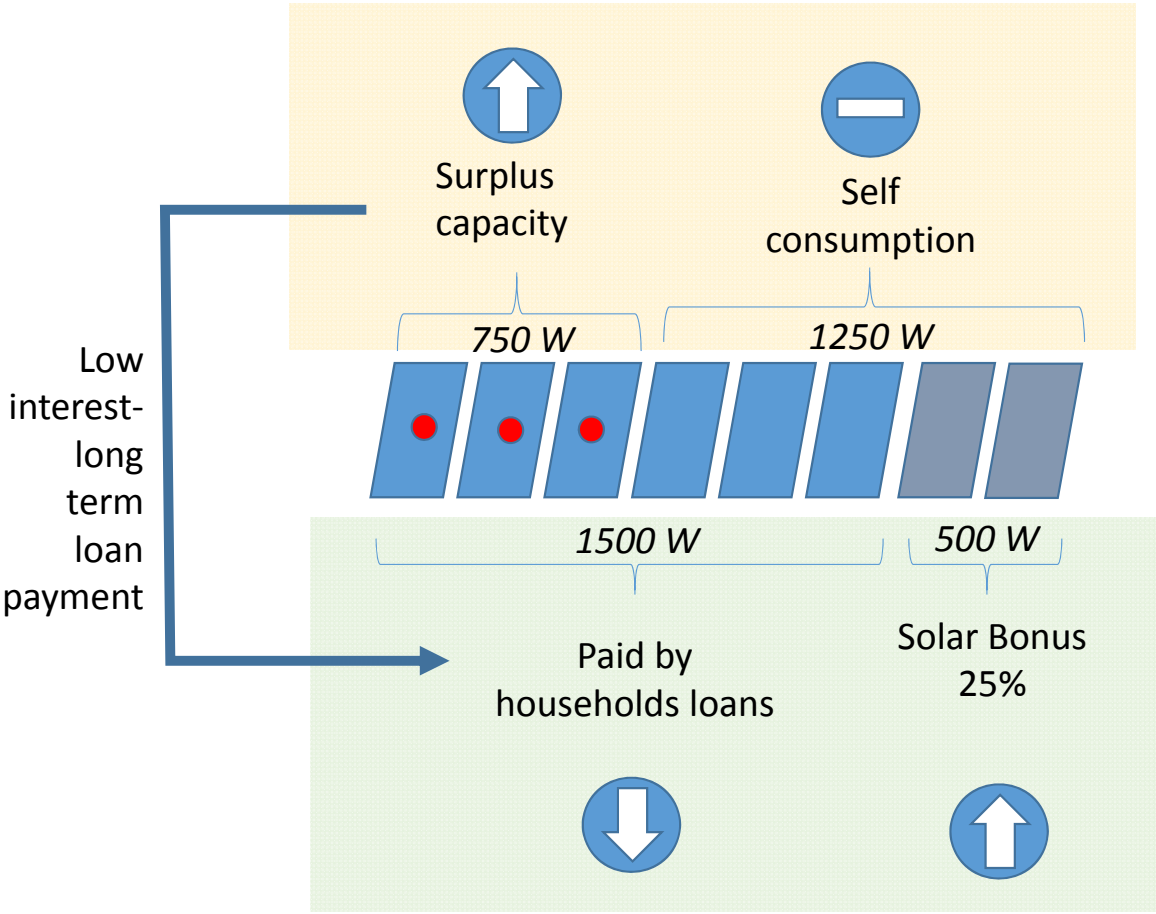
0.18 average



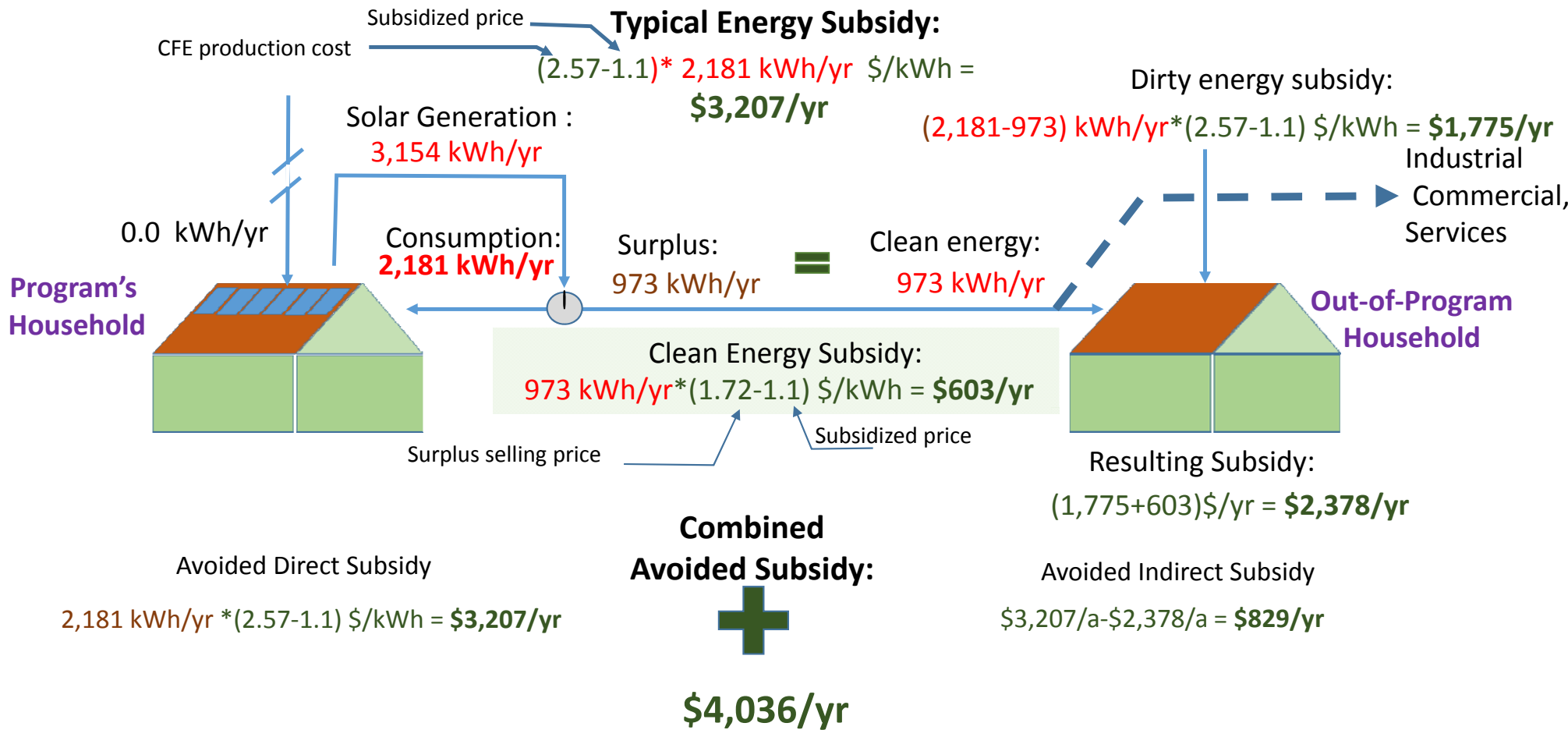
Mechanism's Fundamentals (1)



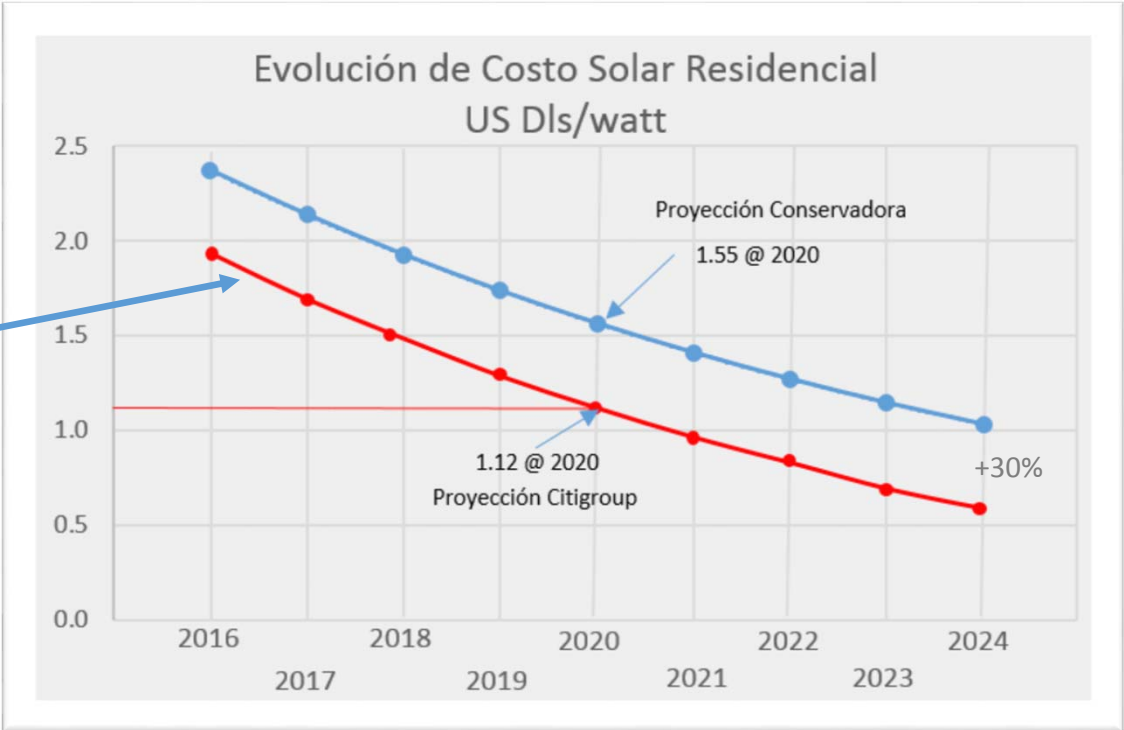
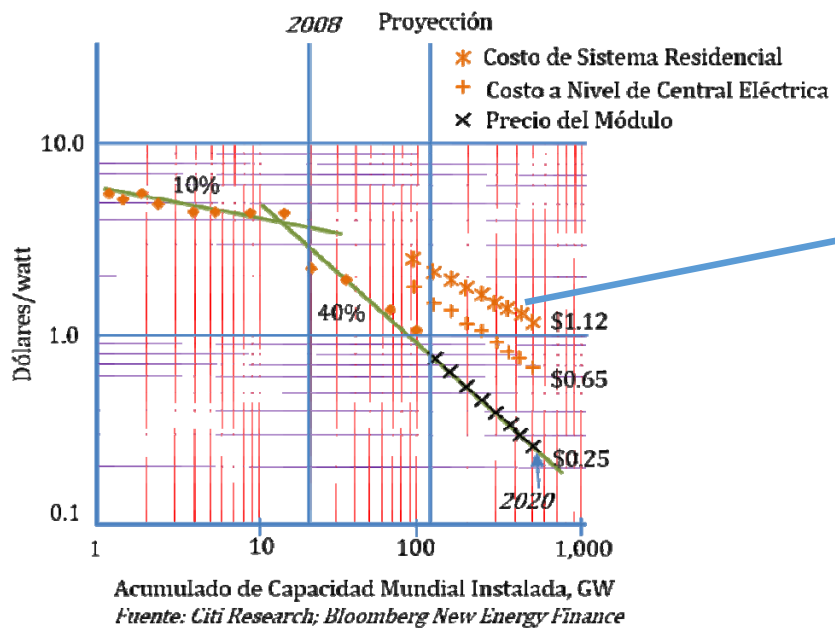
Mechanism's Fundamentals (2)



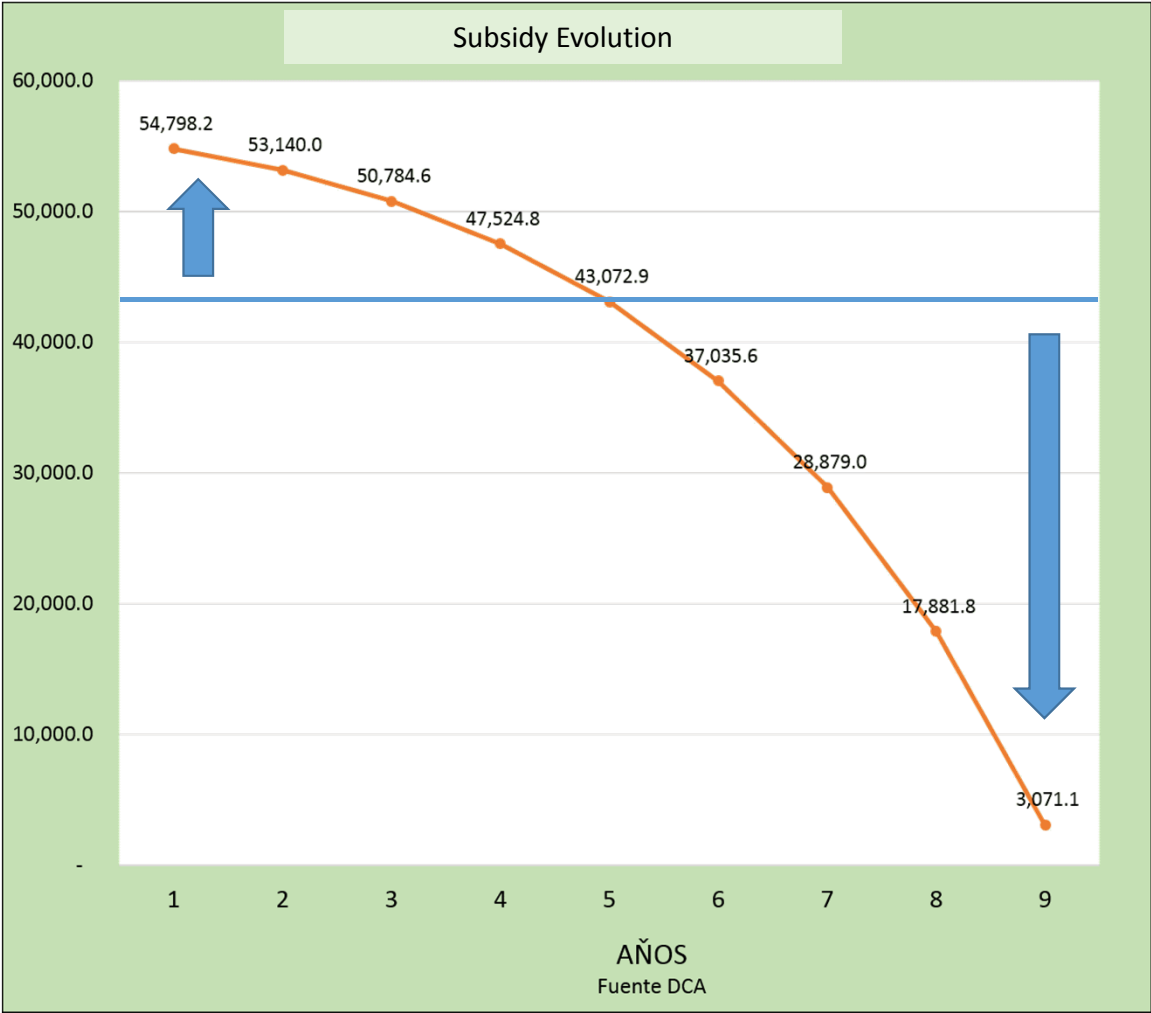
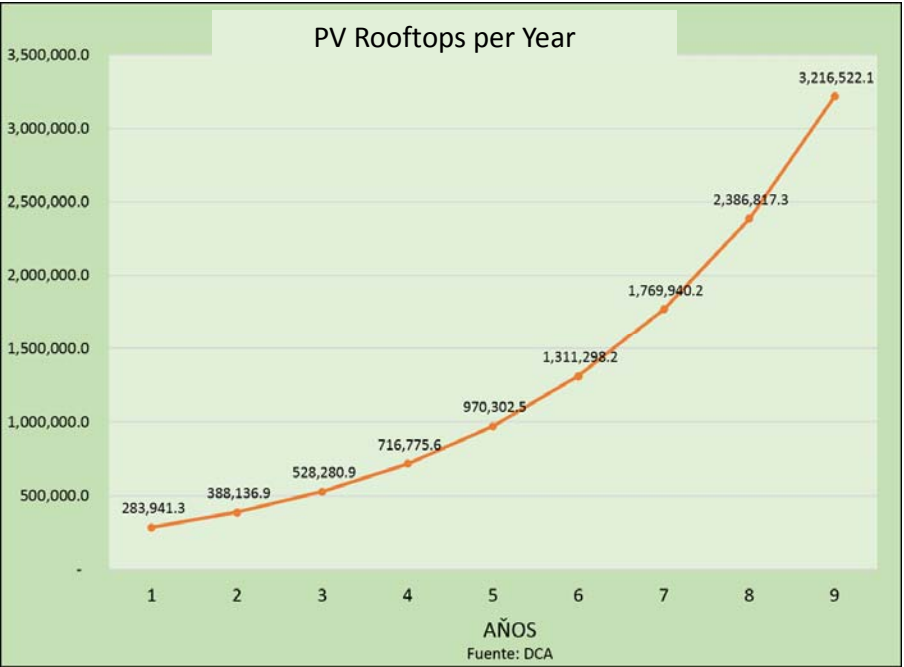
Mechanism's Fundamentals (3). Mexican pesos



PV Technology Learning Curves

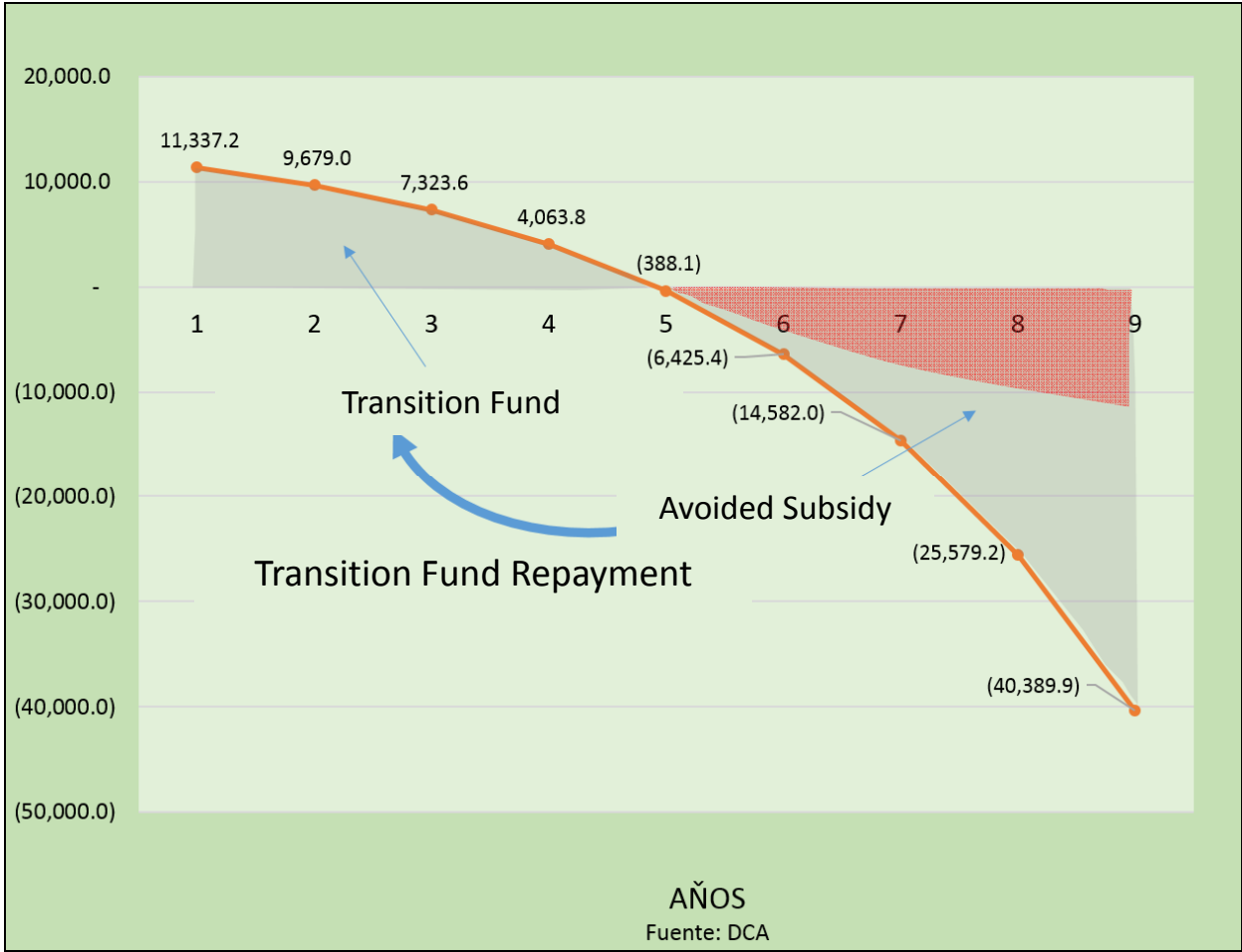


Roadmap for Subsidy Refocusing - Tariff Groups 1B – 1F

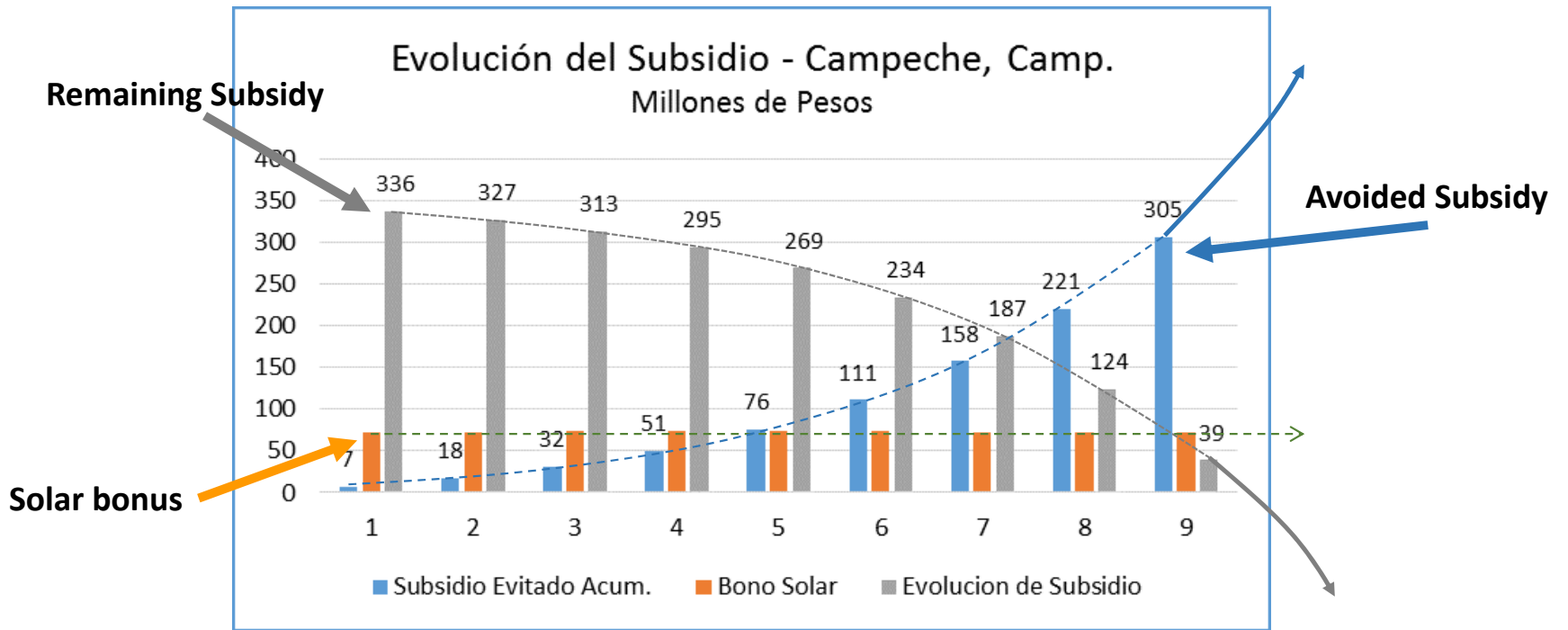


Million Mexican pesos hereinafter

Cash flows for the Subsidy Extinction

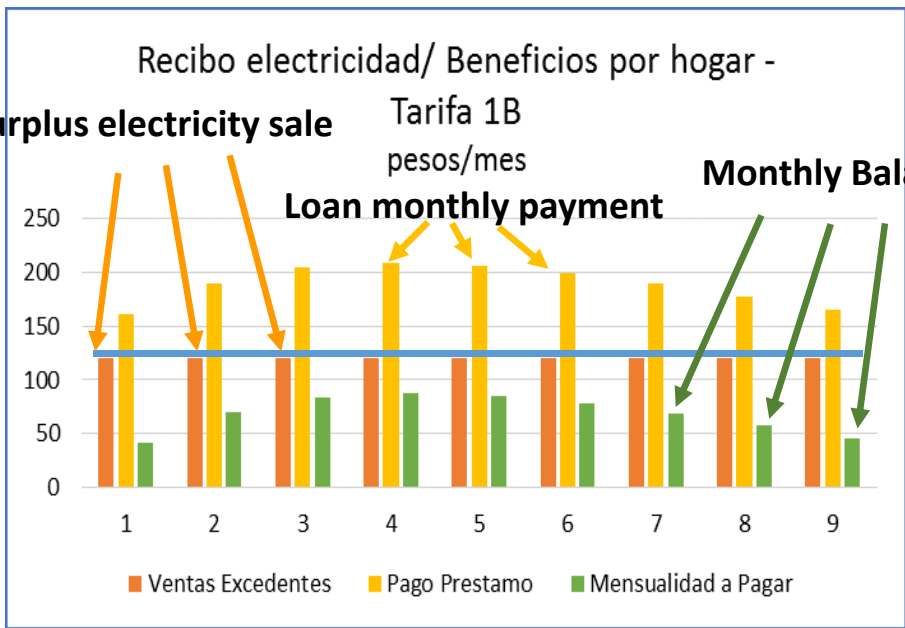


Mechanism Local Example: Caso Campeche, Camp.

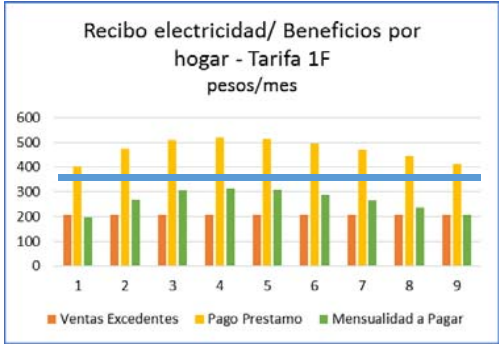
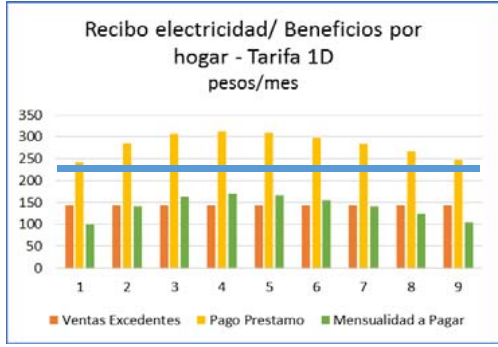
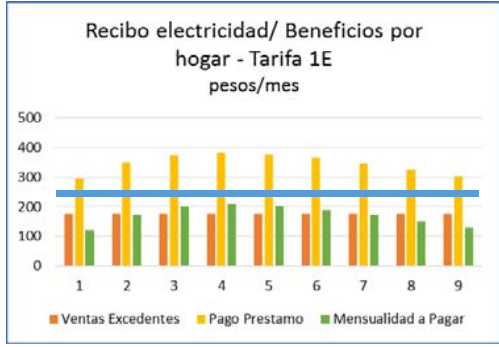
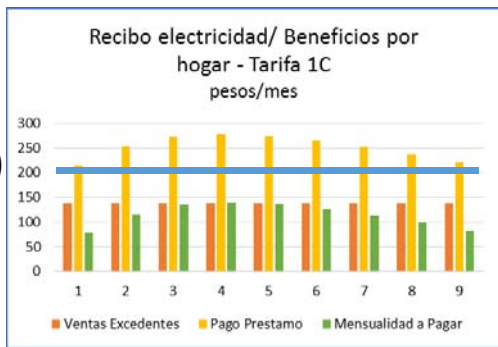


What about the electricity bills?

MX pesos



Today's Monthly Average Electricity Bill



PwC's ToRs

- (1) To define the best roadmap preliminary option to be proposed to the federal government based on the analytical tool developed by LARCI, taking into account the opinions from stakeholders and government officials, and weighing the pros and cons for each option.
- (2) To review the possible implications of the Energy Reform, Electricity Industry Law, Clean Energy Certificates Guidelines, Electricity Market Basis and other regulations on LARCI's SDG mechanism and the impact of potential barriers on the SDG mechanism.
- (3) To review the present tariff structure focusing on those classified as 1B, 1C, 1D, 1E, and 1F, identifying their fundamentals, variants, territories, and potential changes in order to further define and prioritise LARCI's SDG mechanism implementation.
- (4) To analyse the general economics of the SDG mechanism, including present and future solar PV cost structure (hardware and soft costs) at the residential level, learning curves, fiscal benefits, import tariffs, international trade implications, and other factors.
- (5) To model the SDG mechanism's cash flows and profitability for each key player, including the Treasury (SHCP), CFE, potential fund/grant provider, installer/retailer and residential customers, making the necessary adjustments regarding future electricity demand, inflation, exchange rate, changes in tariffs, and value of money.
- (6) To map potential funders/lenders for: (1) the solar bonus, and (2) the residents' loans, as well as their optimal structure regarding number of years, fading rate, payments, SC pool, among others, in order to fulfil the SDG mechanism's fundamentals.
- (7) To study the pros and cons of different business models, such as CFE as the only provider or competing private companies; and direct ownership (Infonavit model) or leasing. In each case, analyse CFE's role as electricity provider and retailer in charge of operating the distribution grid, and measuring, monitoring, billing and collecting payments.
- (8) To apply all the above to a hypothetical case study such as La Paz, Baja California Sur, in order to identify and solve specific situations that could potentially affect the deployment of the SDG mechanism.

Co-funders' ToRs

Tasks to be carried out by partners in an effort coordinated by LARCI and supported by PwC.

- (a) Clarify the electricity subsidy components
- (b) Perform a market survey to identify users perceptions about PV rooftops
- (c) Propose inputs for the required regulatory framework to certify and ensure performance, quality, safety and effective service of solar rooftops.
- (d) Define and detail the financial instruments, and identify potential financial providers and operators.
- (e) Define the institutional framework in charge of implementing the mechanism.
- (f) Build capacity for planning, designing, installing, monitoring and evaluating PV solar rooftops.
- (g) Foresee and propose solutions to the technical challenges, particularly those of interconnection to the grid and grid performance under high PV penetration.
- (h) Foresee opportunities for value chains and scale economies, and proposing solutions to the challenges in these matters for the whole process
- (i) Identify opportunities for piggybacking energy efficiency actions to the SGD mechanism.