

SENER

SECRETARÍA DE ENERGÍA



Mexico's Push for Solar Power Plants and Distributed Generation

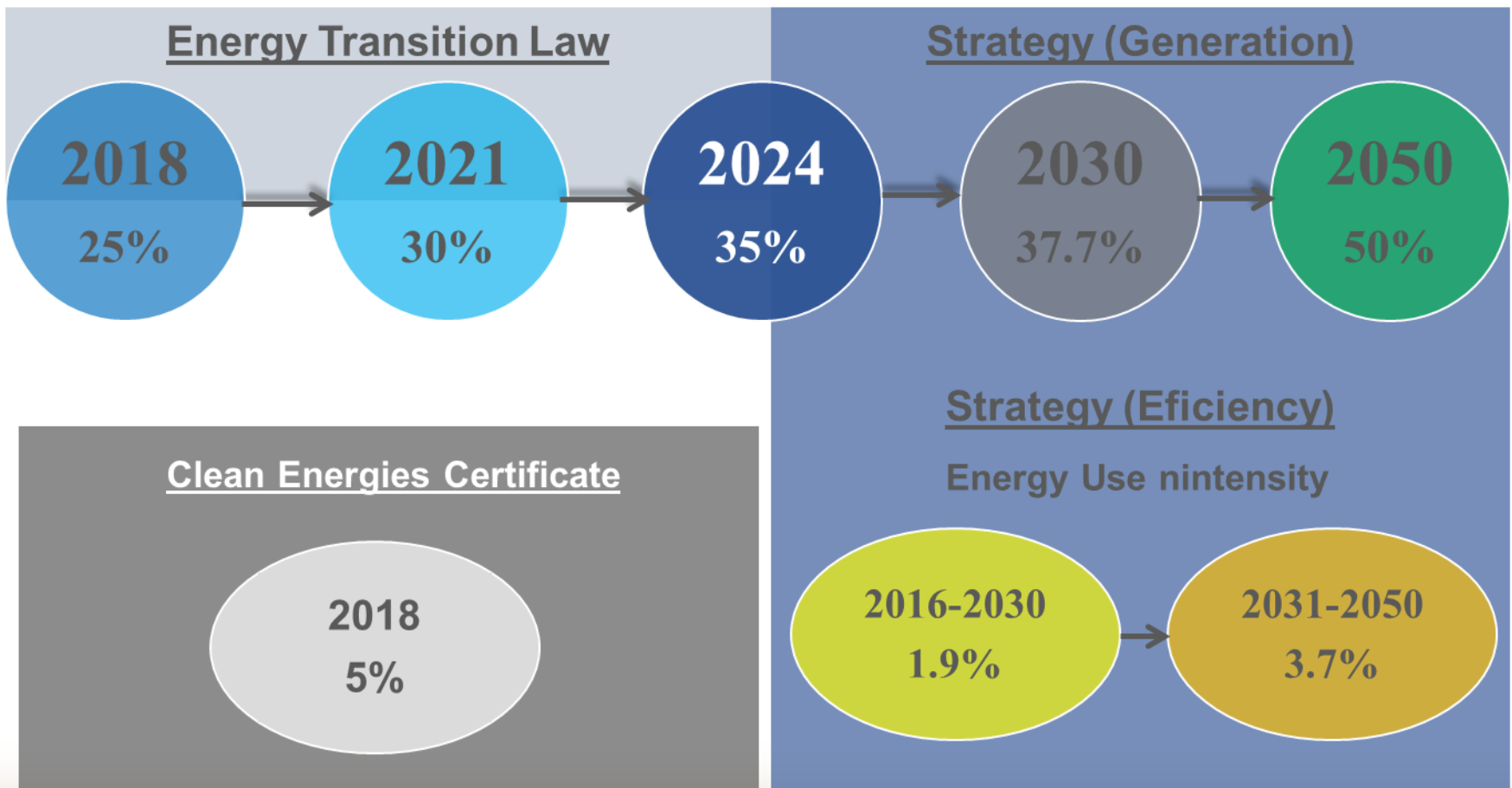
Mexican PV Markets Perspective

Intersolar Europe 2018

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Programa Energia Solar a Gran Escala en México - DKTI-Solar

Energy Transition for Clean Energy Transition

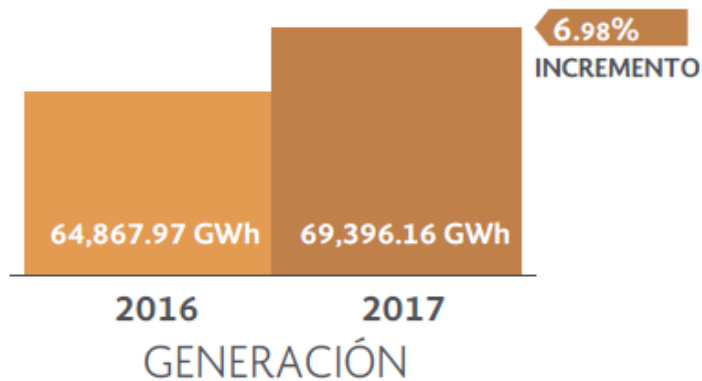
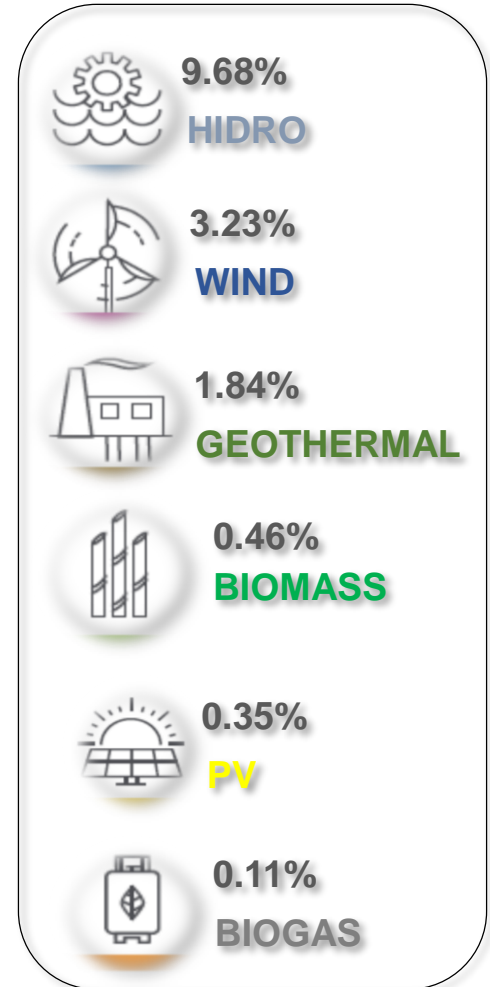
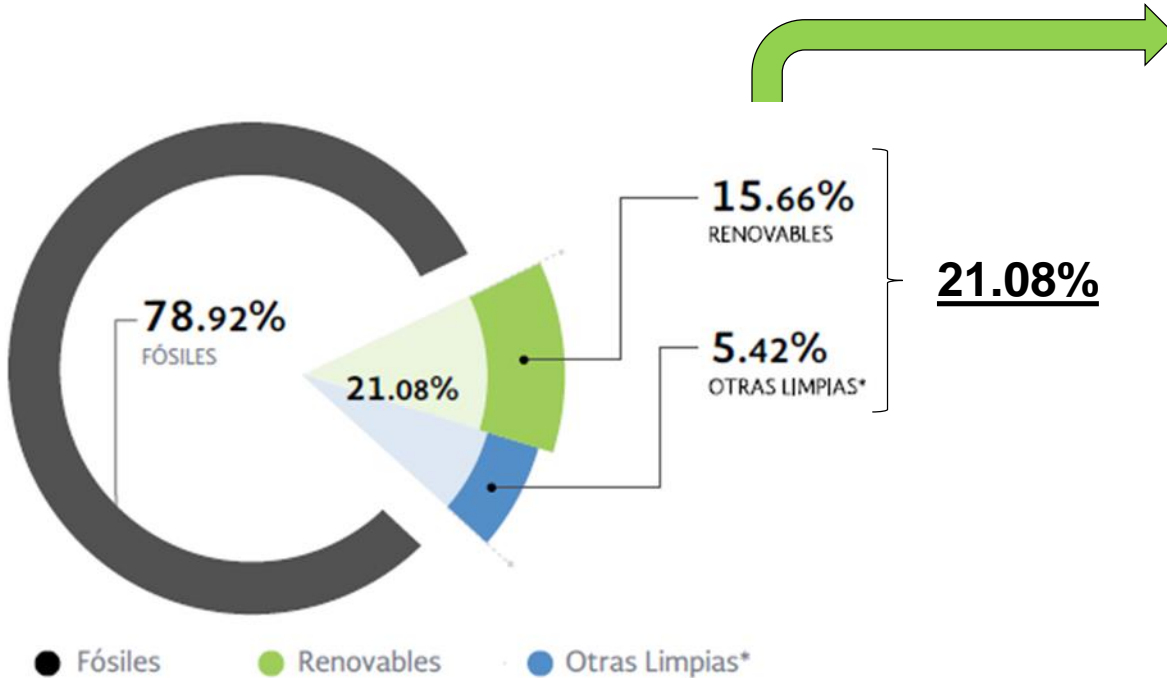


Energy Transition. Strategy + other compromises



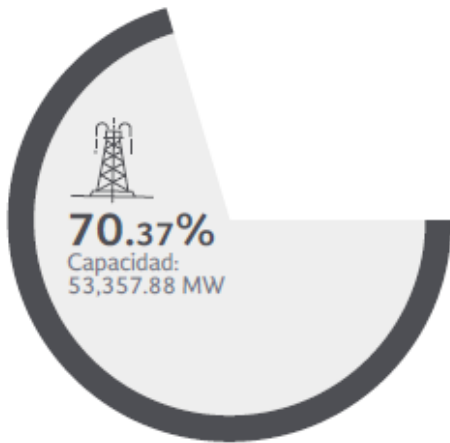
CLEAN ENERGIES PARTICIPATION GENERATION (2017)

TOTAL GENERATION: **329,162 GWh**

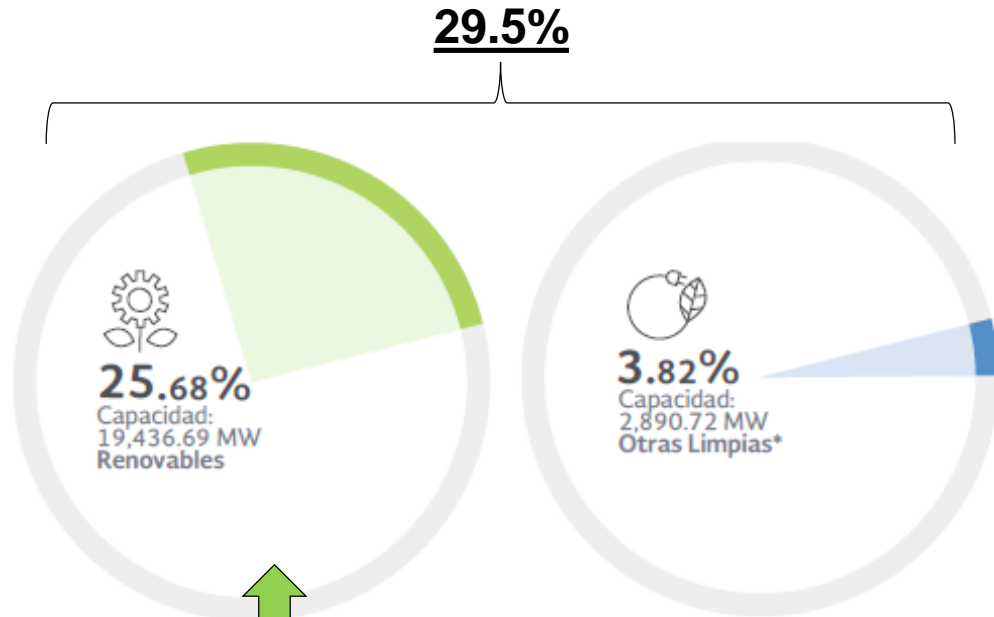


CLEAN ENERGIES PARTICIPATION INSTALLED CAPACITY (2017)

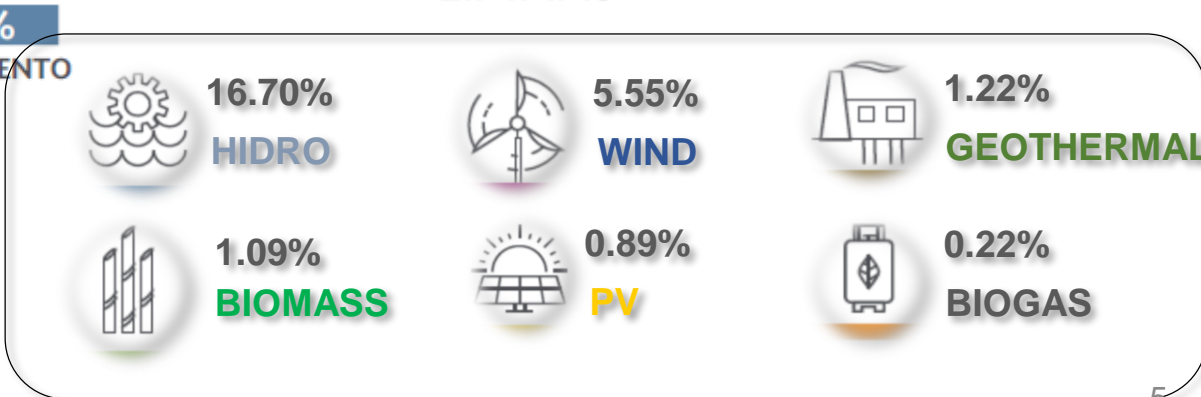
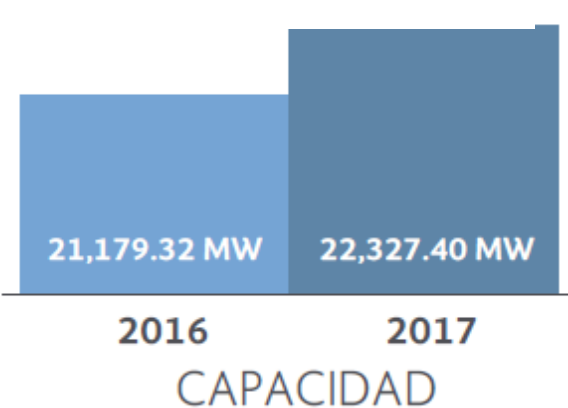
TOTAL CAPACITY: **75,685 MW**



FÓSILES



LIMPIAS



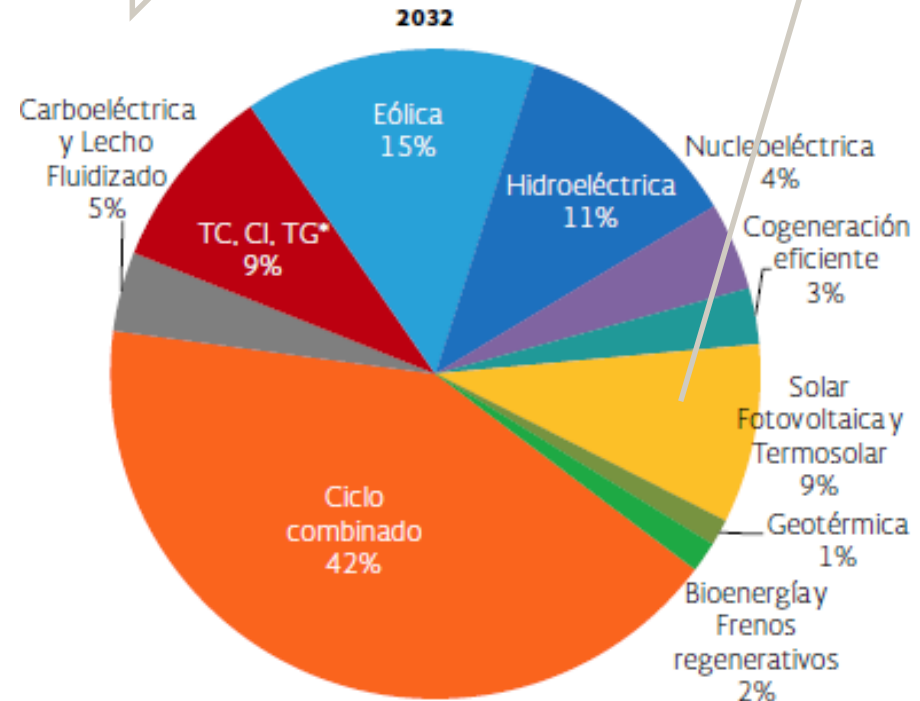
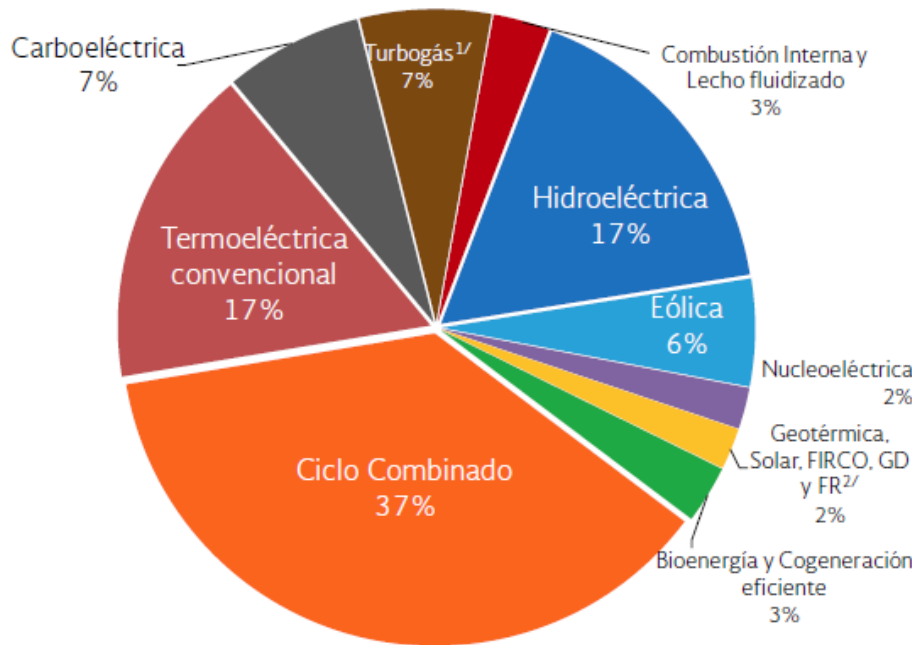
Power capacities: Status quo and additions until 2032

2017: 76 GW

+54 GW

2032: 130 GW

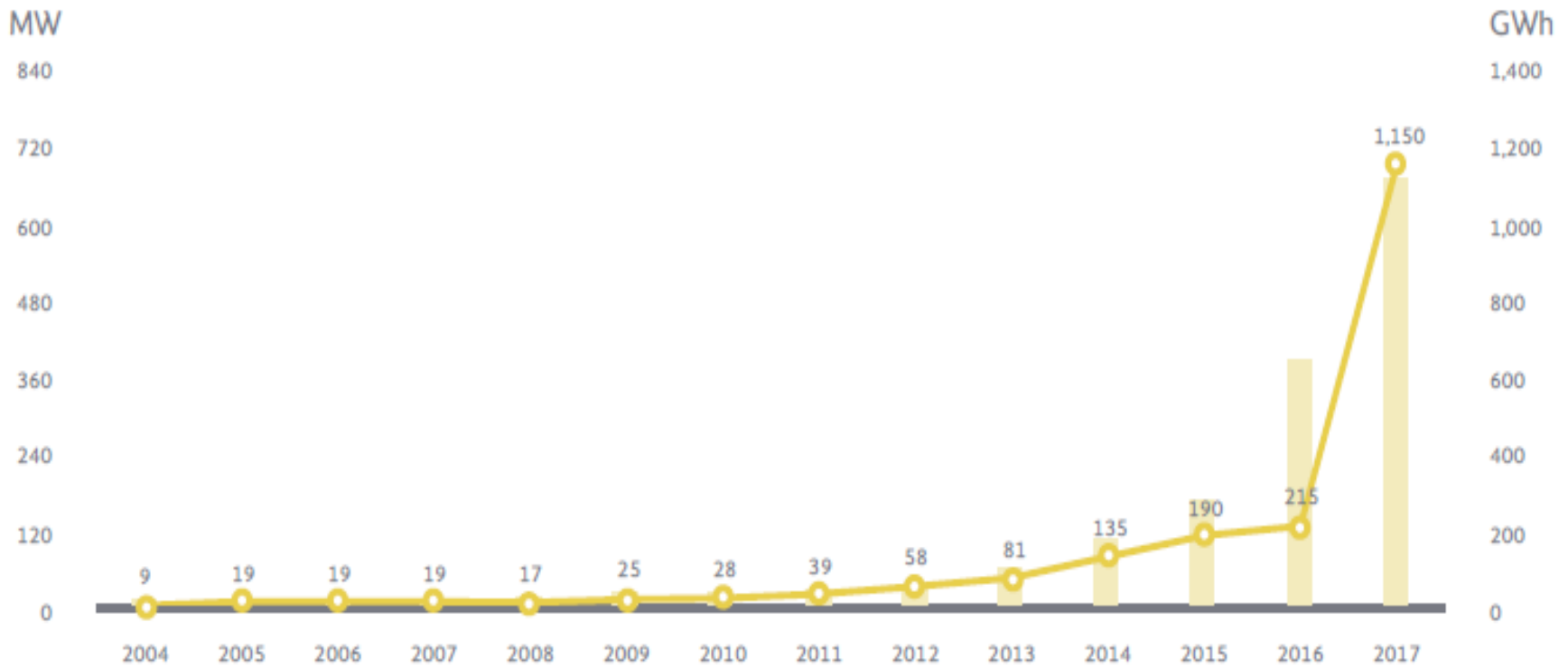
**11,7 GW
Solar PV**



Framework & Incentives for Solar

Accelerated depreciation	100% of investments in machinery and equipment used for renewable energy generation. Include fixed assets, expenses and deferred charges. Min 5 years operation
Clean Energy Certificates (CELS)	Mandate to generate 5% of overall consumption by clean energy in 2018. All market participants that consume electricity in the system must comply with the mandate and can use CELs to meet obligations. Solar is a sources eligible for CELs.(1CEL=1MWh)
Wholesale Electricity Market & Auctions	Regulated Auctions for Electricity suppliers (eg CFE) for clean energy, capacity and CELs
Distributed Generation	Billing credit for excess electricity generated by RE facilities of retail electricity consumer
Sustainable Energy Fund	R&D Renewable energy and energy efficiency. Projects and calls managed by SENER and CONACYT
other	Non-discriminatory network access; reation of wholesale markets, Improved information provision; simplified approval processes

PHOTOVOLTAIC DEVELOPMENT)

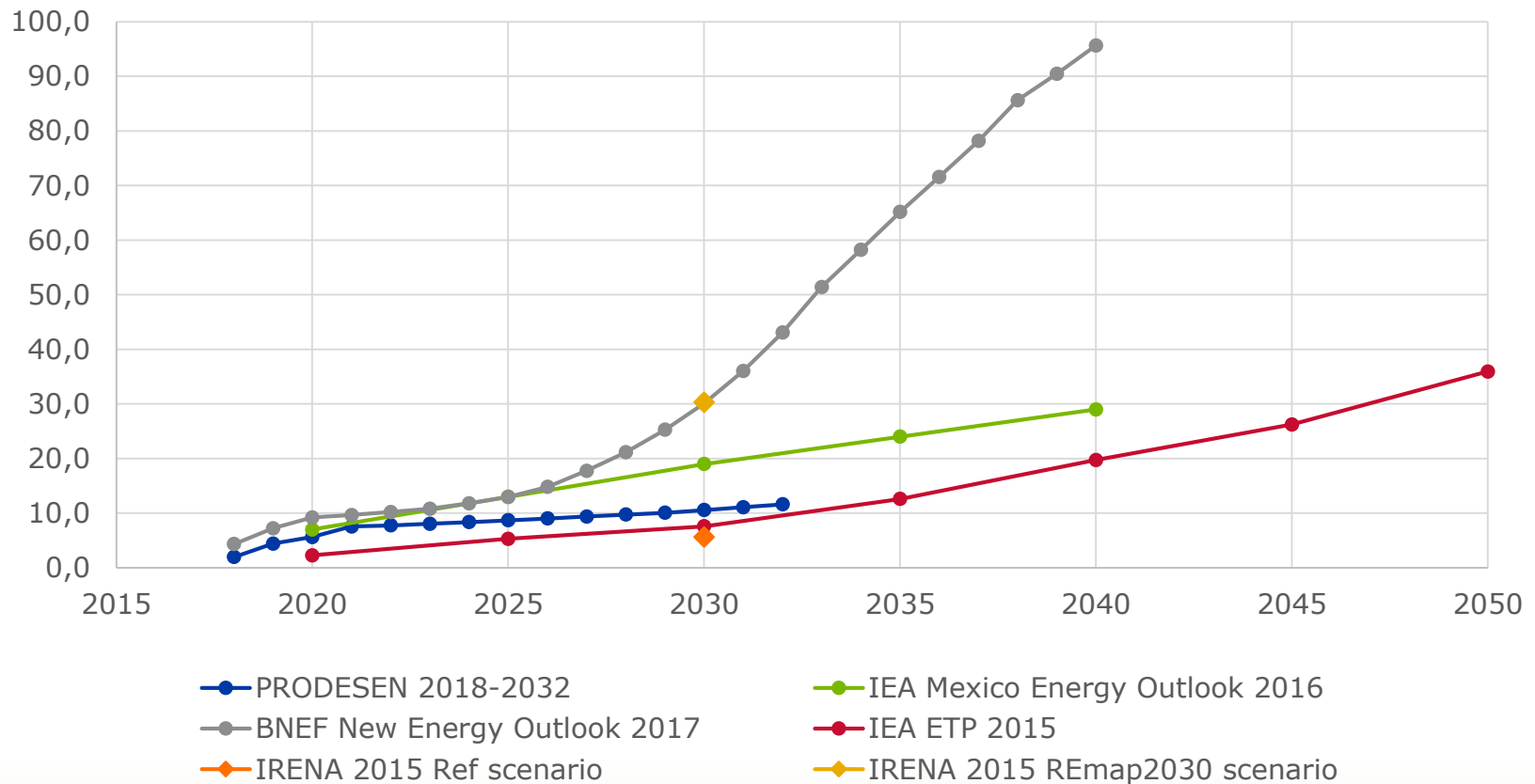


Photovoltaic generation in 2017 increased 5 times the generation of 2016.

It's expected that capacity installed is going to growth 10 times in the next 3 years as result of the Clean Energy Auctions

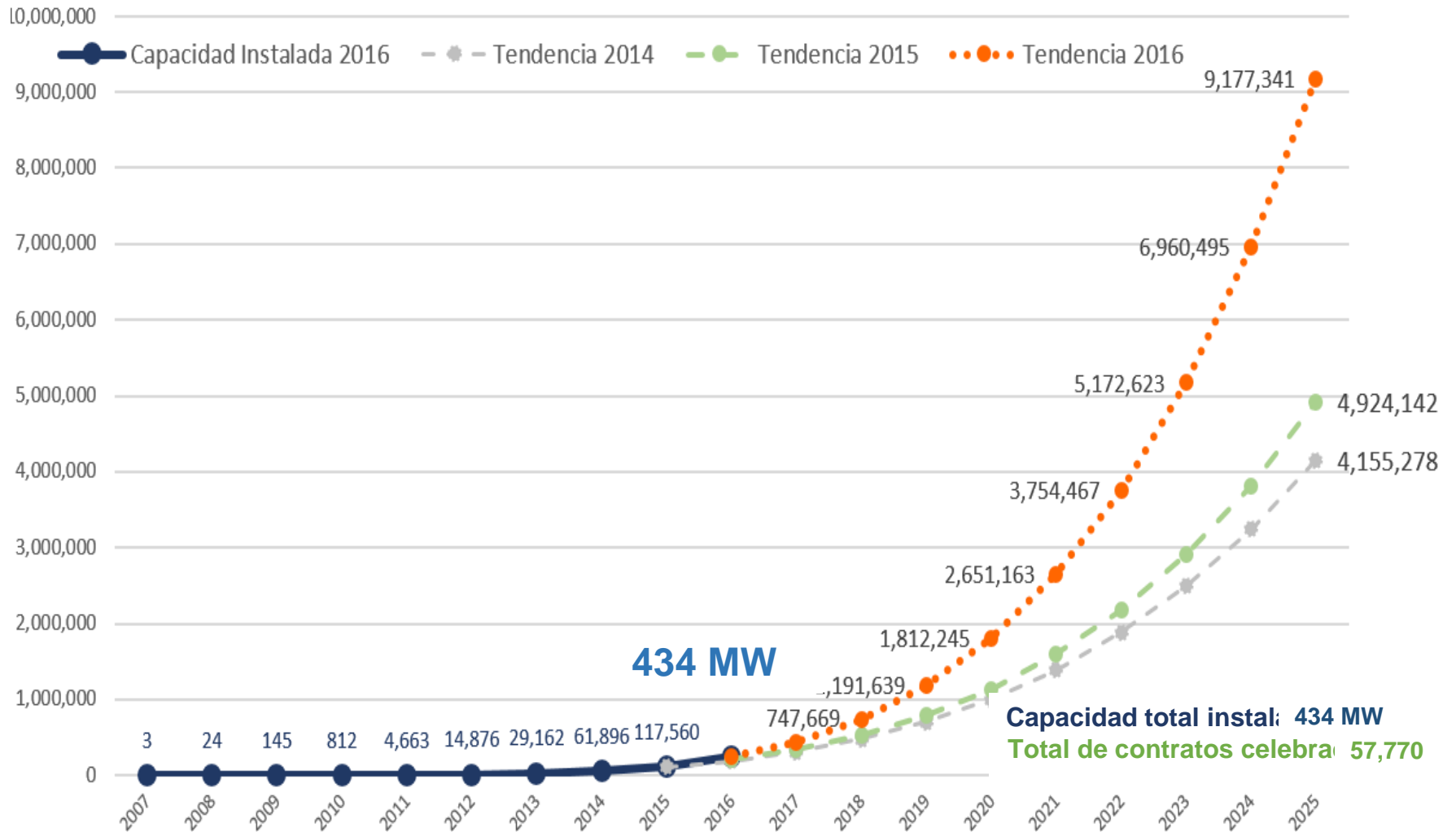
Solar Market Growth Projections

PV Installed Capacity (GW, cumulative)



SMALL AND MEDIUM SCALE INTERCONNECTION CONTRACTS (TENDENCIES)

INSTALLED CAPACITY



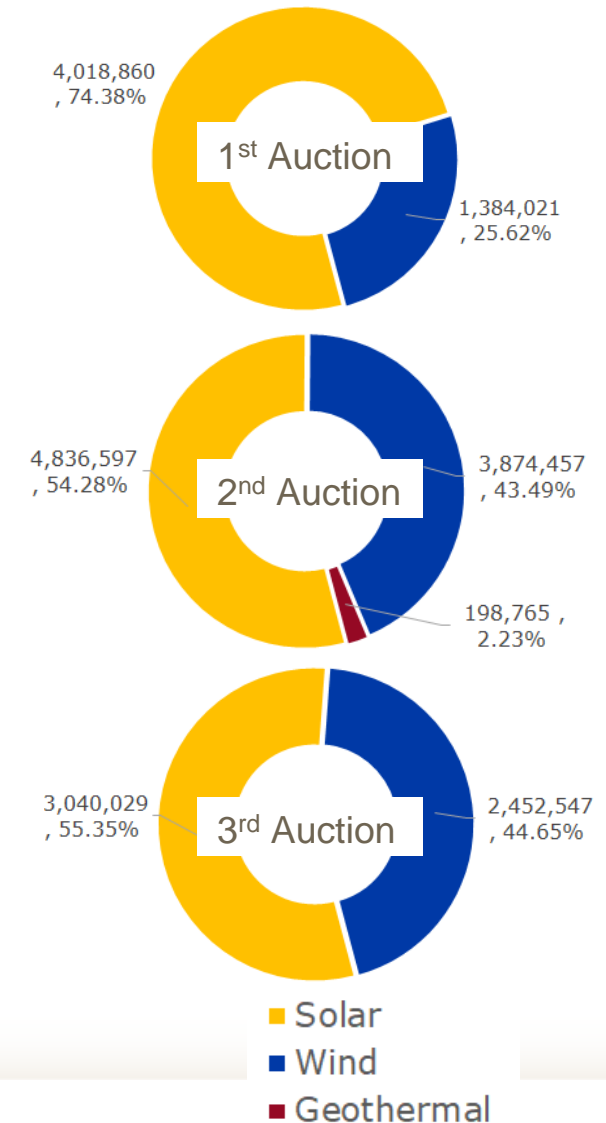
Elaboración propia con datos proporcionados por la CFE.

Fecha de corte al 31 de diciembre de 2017

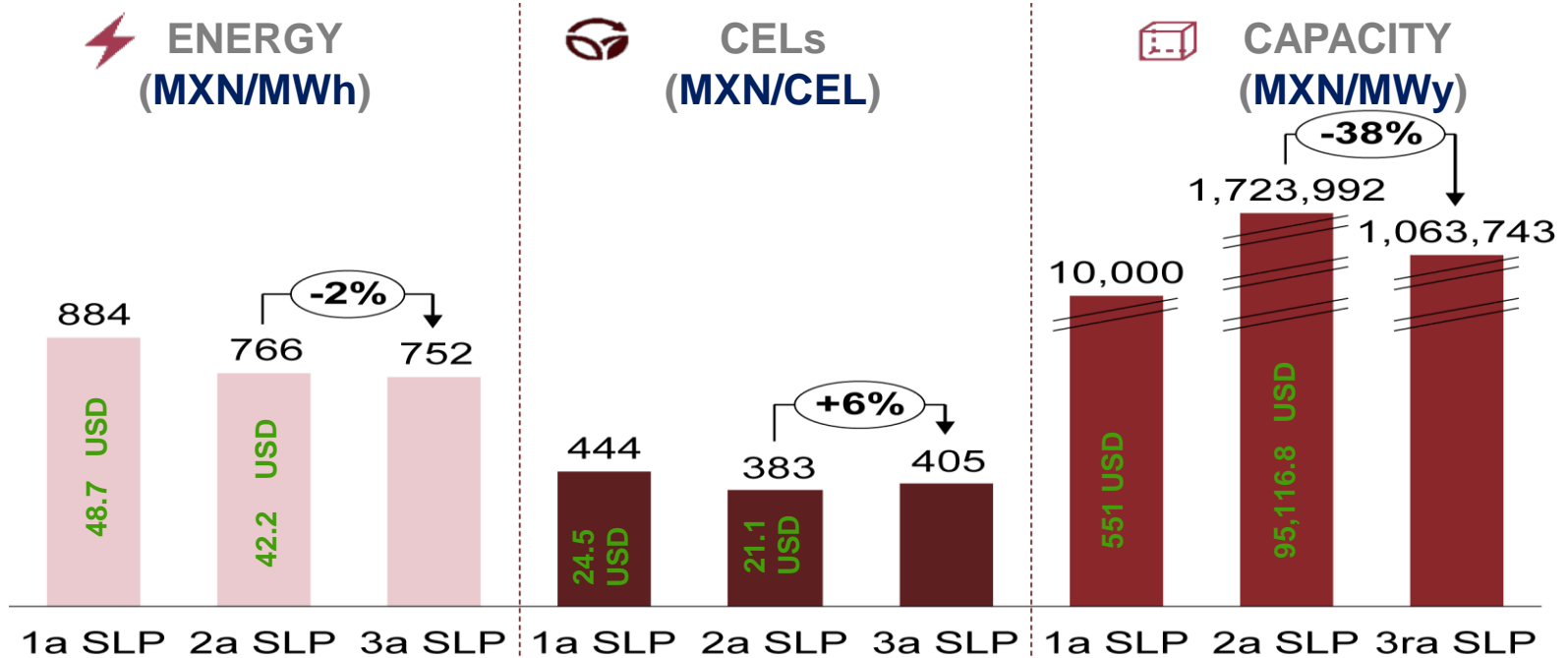
www.gob.mx/cre/documentos/pequena-y-mediana-escala

Energy (MWh/year)

Auction	1st (2015)	2nd (2016)	3rd (2017)	
Expected Investment (billion USD) ¹	2.6	4	2.4	
Solar PV	2.1	2.5	1.6	
Wind	0.5	1.5	0.8	
Products traded / Buyer	CFE	CFE	CFE	Non CFE
Capacity (MW/year)	0	1,187	592	
Solar	0	184	10	
Eólica	0	128	83	
Energía (MWh/año)	5,402,881	8,909,819	5,003,172	489,403
Solar	4,018,860	4,836,597	3,040,028	
Eólica	1,384,021	3,874,457	2,452,547	
CEL (CEL/año)	5,380,911	9,275,534	5,422,185	530,390
Prices (USD/MWh+CEL)				
Solar Weighed avg	\$45.06	\$31.89	\$20.77	
Solar Min	\$35.46	\$25.70	\$18.90	
Solar Max	\$68.16	\$37.60	\$23.30	
Wind Min	\$42.85	\$32.00	\$17.76	
Wind Max	\$66.92	\$39.20	\$19.55	
Exchange rate (MXN/USD)	\$17.32	\$19.152	\$19.185	
Sum peak capacity of winning plants (MW)	2,085	3,883	2,562	
Solar	1,691	1,853	1,323	
Wind	394	1,038 ²	689 ³	
Geothermal	-	25	-	
Hydro	-	68 ⁴	-	
Combined Cycle - Nat Gas (capacity only)	-	899	-	
Turbogas (capacity only)	-	-	550	
Total projects	16	22	16	
Solar	11	17	9	
Wind	5	5	5	



LONG TERM AUCTIONS COMPARATIVE



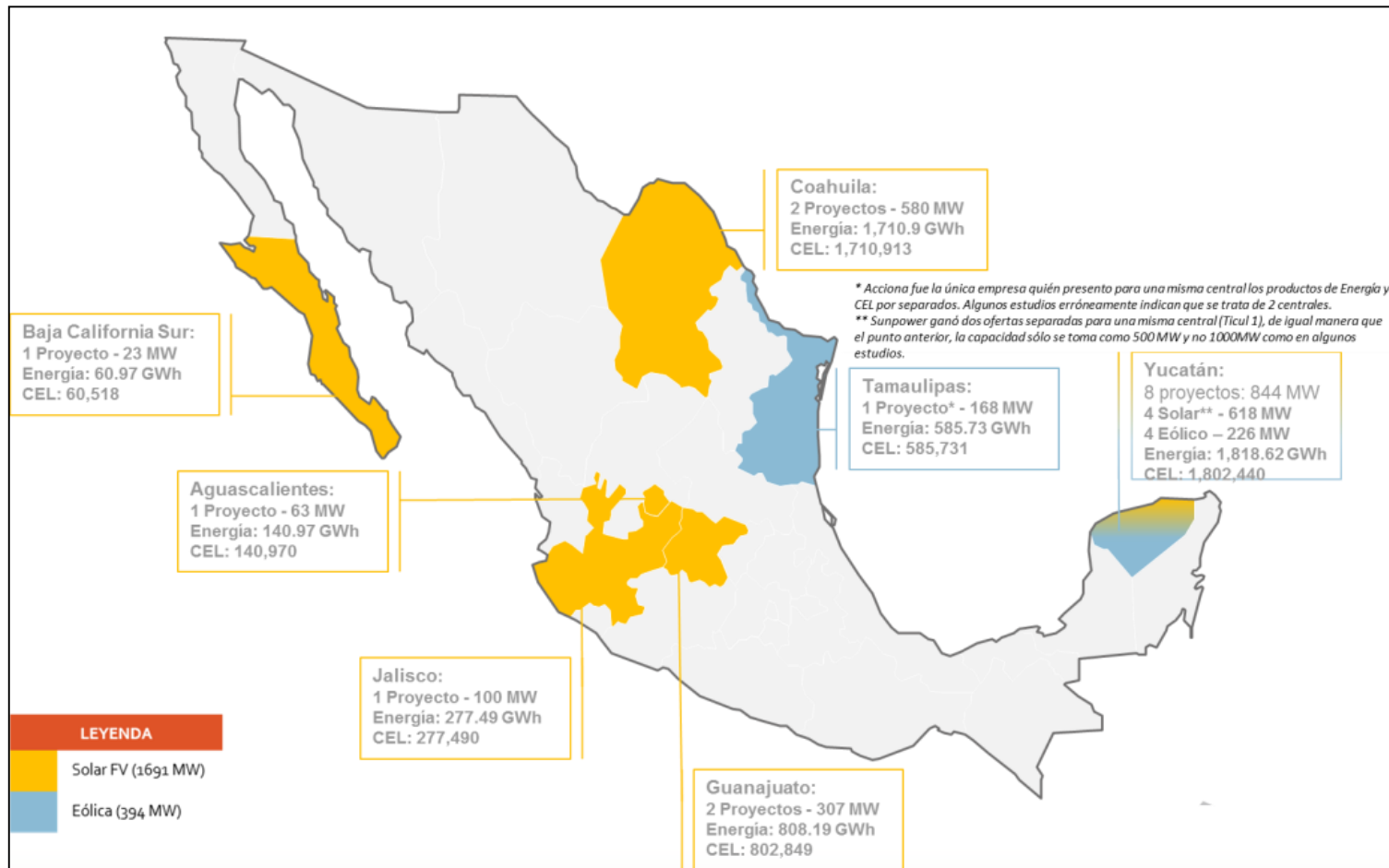
AVERAGE PRICE (1a SLP) = 47.70 USD/MWh
AVERAGE PRICE (2a SLP) = 33.80 USD/MWh
AVERAGE PRICE (3a SLP) = 20.57 USD/MWh

AVERAGE PRICE (3o vs. 2o) = 39% ▼

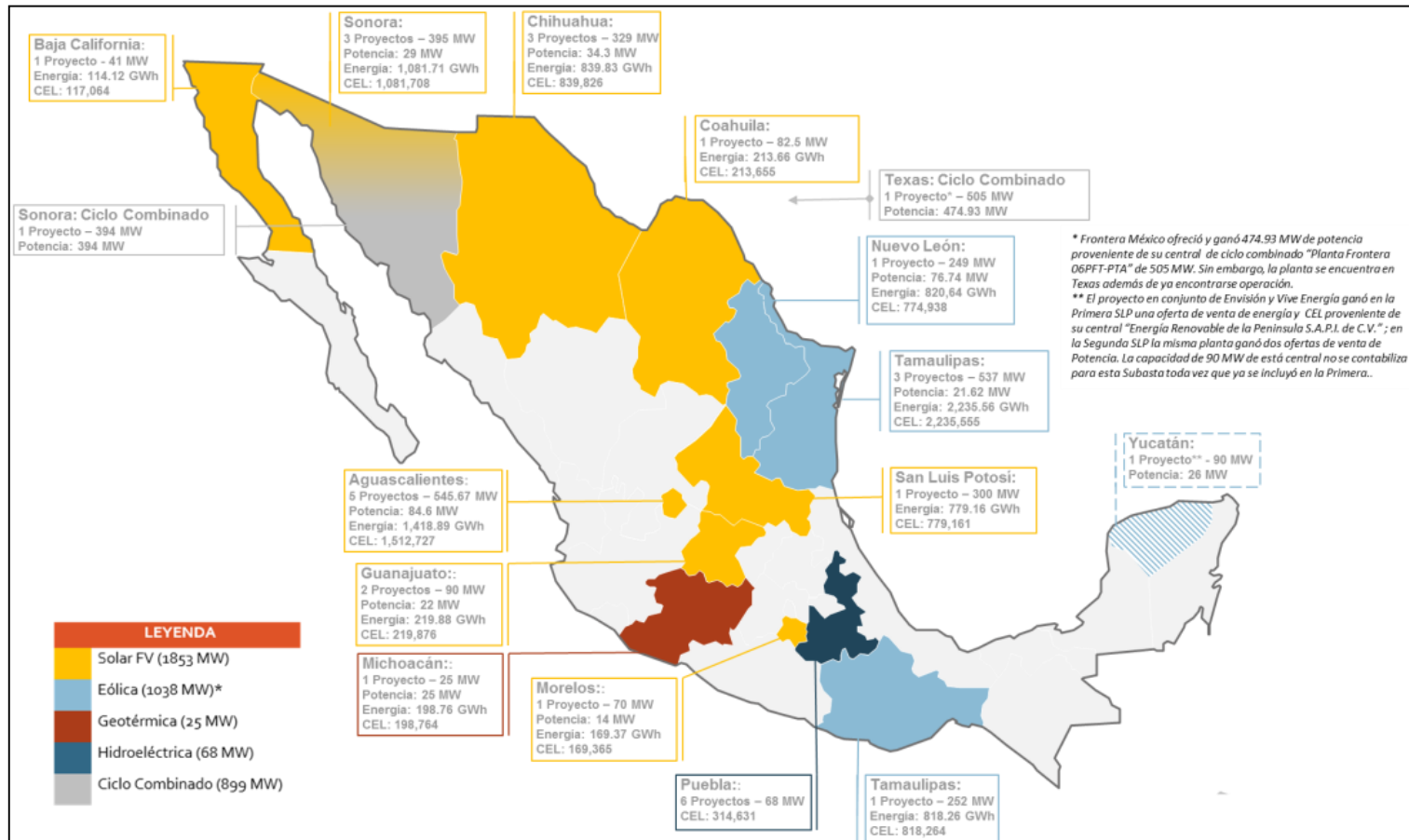
ADDITIONAL CAPACITY AUTHORIZED ER (1o+2o+3o)= ca. 7,451 MW ▲

RENEWABLE ENERGY INVESTMENT (1o+2o+3o) = ~ 8,600 millions USD ▲

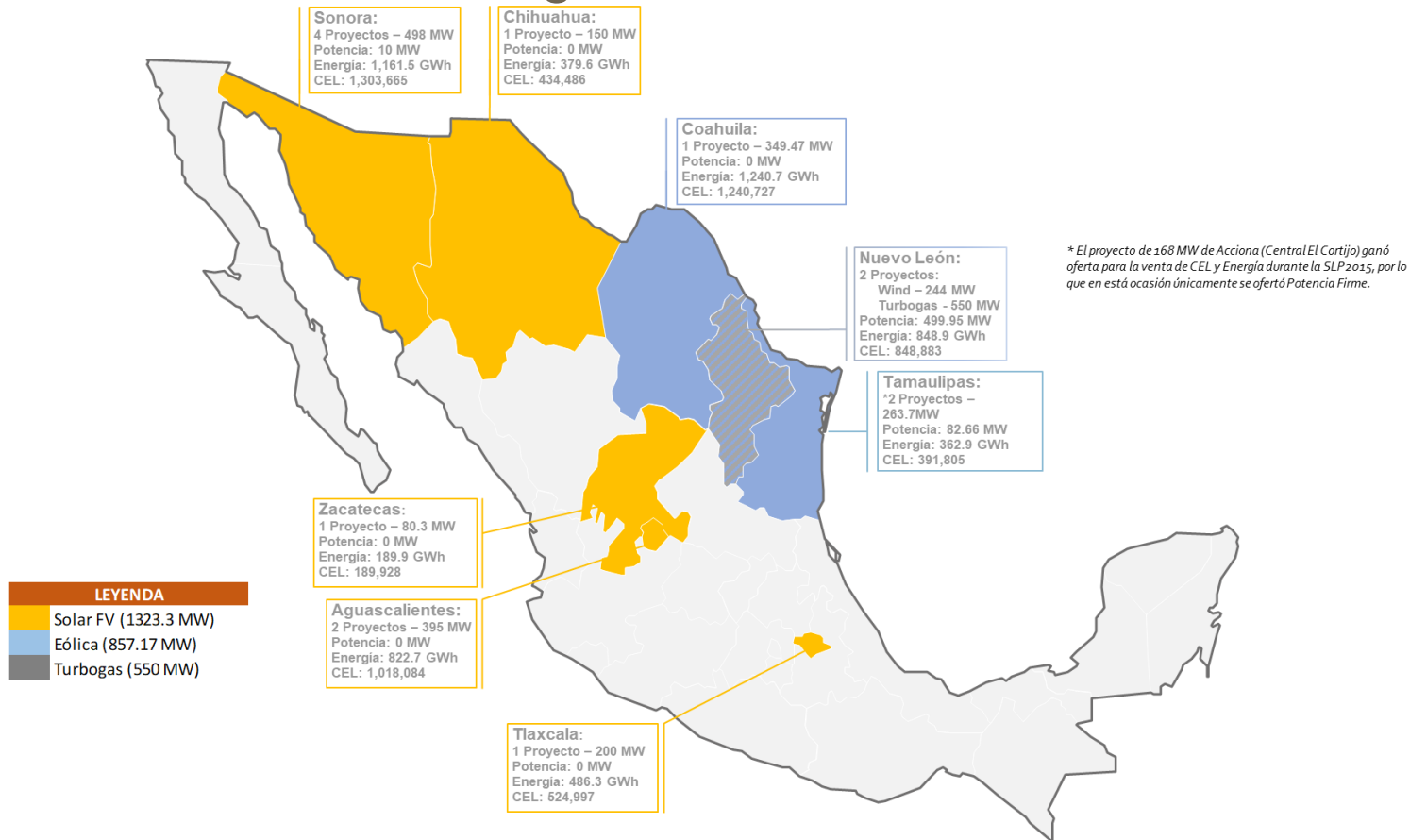
Locations of winning bids – 1st auction



Locations of winning bids – 2nd Auction



Locations of winning bids – 3rd Auction



Thanks for your attention

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