

An Outlook to Turkish Electricity Market in terms of Regulatory Framework



Power Projects and Investment Opportunities in Turkey and Middle East

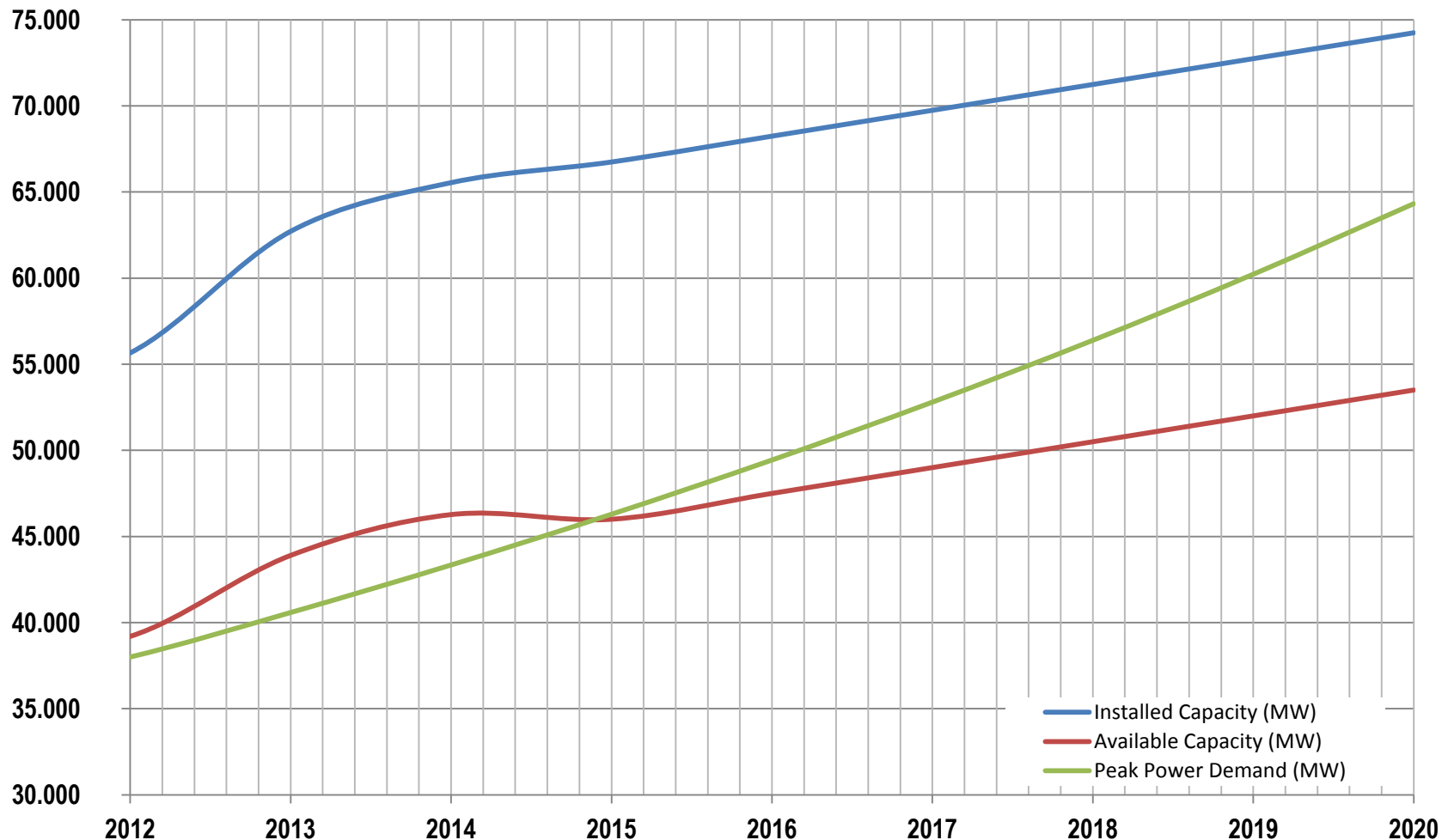
Supply-Demand Balance of Turkey

High Scenario - Figures

Year	Installed Capacity (MW)	Increase in Installed Capacity (MW)	Available Capacity (MW)	Peak Power Demand (MW)	Deficiency in meeting Peak Power Demand (MW)	Increase in Peak Power Demand (%)	Reserve Power Capacity (%)	Energy Demand (GWh)	Increase in Energy Demand (GWh)	Increase in Energy Demand (%)	Investment Needed (USD/Year)
2010	49.562		35.000	33.392	1.608	11,80	29,38	210.434		7,90	
2011	53.316	3.754	38.000	36.122	1.878	8,20	28,73	229.344	18.910	9,00	8.258.800
2012	55.659	2.343	39.200	38.000	1.200	5,20	29,57	244.026	14.682	7,50	5.154.600
2013	62.717	7.058	43.900	40.584	3.316	6,80	30,00	262.572	18.546	7,60	15.527.600
2014	65.544	2.827	46.270	43.344	2.926	6,80	29,41	282.527	19.955	7,60	6.219.400
2015	66.744	1.200	46.000	46.291	- 291	6,80	31,08	304.000	21.473	7,60	2.640.000
2016	68.244	1.500	47.500	49.439	- 1.939	6,80	30,40	326.799	22.799	7,50	3.300.000
2017	69.744	1.500	49.000	52.801	- 3.801	6,80	29,74	350.983	24.184	7,40	3.300.000
2018	71.244	1.500	50.500	56.391	- 5.891	6,80	29,12	376.604	25.621	7,30	3.300.000
2019	72.744	1.500	52.000	60.226	- 8.226	6,80	28,52	403.720	27.116	7,20	3.300.000
2020	74.244	1.500	53.500	64.321	- 10.821	6,80	27,94	432.788	29.068	7,20	3.300.000
Toplam											46.041.600(*)

(*) 1 MW Investment = 2.2 Billion USD

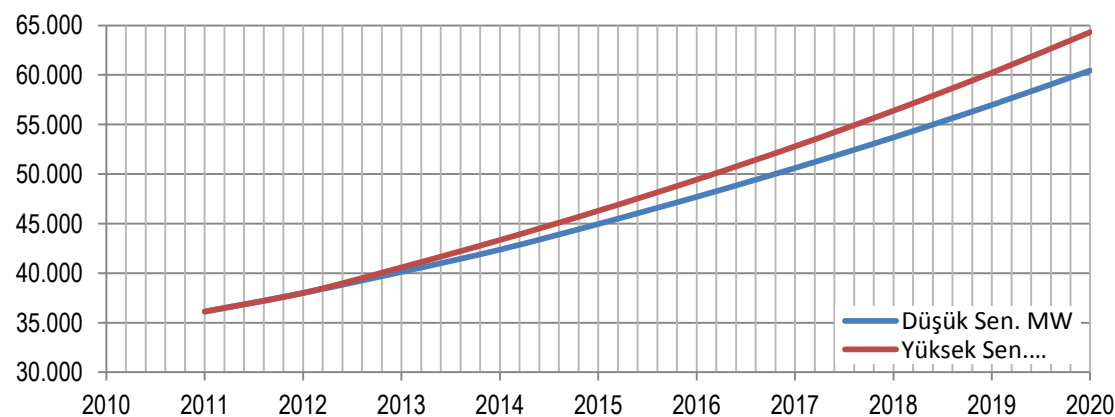
High Scenario – Projections



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High Scenario – Power Demands

	Low Scenario	High Scenario	Low Scenario	High Scenario
	MW	MW	Growth (%)	Growth (%)
2011	36.122	36.122	7,80	7,80
2012	38.000	38.000	5,20	5,20
2013	40.128	40.584	5,60	6,80
2014	42.375	43.344	5,60	6,80
2015	44.960	46.291	6,10	6,80
2016	47.703	49.439	6,10	6,80
2017	50.612	52.801	6,10	6,80
2018	53.700	56.391	6,10	6,80
2019	56.976	60.226	6,10	6,80
2020	60.451	64.321	6,10	6,80

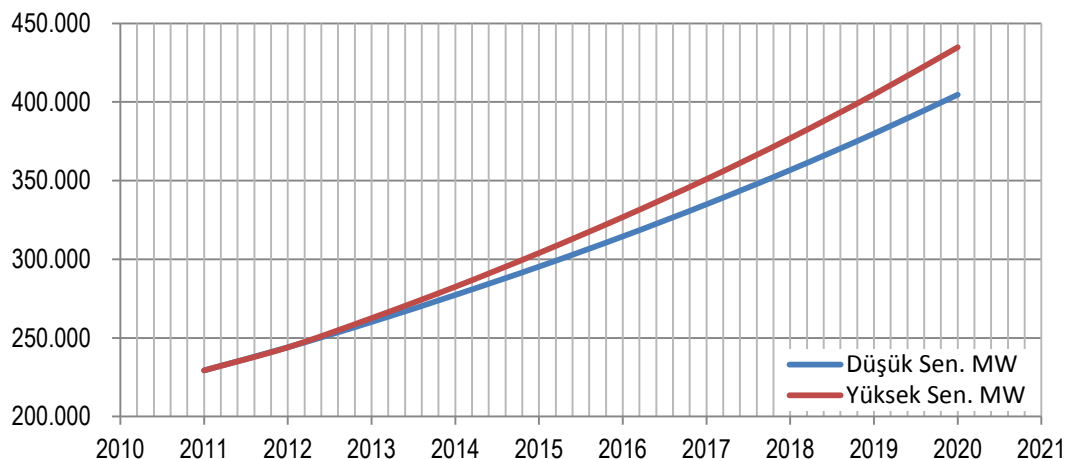


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Supply-Demand Balance of Turkey

High Scenario – Energy Demands

	Low Sen.	High Sen.	Low Sen.	High Sen.
	MW	MW	Growth (%)	Growth (%)
2011	229.344,00	229.344,00	9,00	9,00
2012	244.026,00	244.026,00	7,50	7,50
2013	260.132,00	262.572,00	6,60	7,60
2014	277.300,00	282.527,00	6,60	7,60
2015	295.325,00	304.000,00	6,50	7,60
2016	314.521,00	326.799,00	6,50	7,50
2017	334.965,00	350.983,00	6,50	7,40
2018	356.738,00	376.955,00	6,50	7,40
2019	379.926,00	404.850,00	6,50	7,40
2020	404.621,00	434.809,00	6,50	7,40



Opinions - Conclusions

- Annual demand growth rate is still too high, i.e. 7.5 % and does not seem to fall,
- This demand growth rate seems to lead most likely to a serious supply-demand deficiency in 2015 (w.r.t. High Scenario) or in 2017 (w.r.t. Low Scenario),
- Total investment needed for the generation sector, by the end of 2020 is about 46 billion USD, with no obvious solution for funding,
- Investment needed in each year is about $46 / 8 = 5.75$ billion USD, which is too high and seems to be unrealizable unless private sector is invited and encouraged to participate the projects,

Opinions - Conclusions

- Within the next 8 years, $74.2 - 55.6 = 18.6 \times 10^3$ MW generation capacity needs to be installed, implying that; 2.32×10^3 MW is to be installed in each year, which seems to be unreasonable,
- Nuclear power seems to be one of the most significant alternatives for restoring the supply-demand balance,
- But the first unit of Akkuyu that will be put in service in 2020, seems to be too late for helping to restore the supply demand gap, furthermore the social reaction to nuclear power projects is growing,
- In any case, Nuclear power projects will have an increasing importance everywhere, contrary to social reactions,

Opinions - Conclusions

- Energy prices seem to be continually rising, due to both financial burden arising from the financial bottleneck in Europe and continually rising fuel prices in the Middle East,
- Financial resources for energy projects will no longer be easily available, as was so in the past, hence more severe conditions will be imposed on feasibility studies,
- The rise in energy prices will definitely lead the society to more stringent measures for energy efficiency,
- Energy efficiency measures that were regarded to be unfeasible in the past, will turn out to be feasible and attractive,

Opinions - Conclusions

- A wide field of commercial opportunities will be available for the experts on energy efficiency, both in the domestic and in industrial levels,
- The efforts for discovering cheaper alternative technologies for energy production will most likely be unpromising, thus the fuel prices, in particular gas prices seem to continue rising,
- Coal prices will closely follow gas prices, tending to increase in the same proportion,

Opinions - Conclusions

- New energy technologies will most likely be developed on the demand side, for improving energy efficiency both in the domestic and in industrial levels,
- Increasing energy prices will most likely increase the attention to coal resources and to improve clean generation technologies,
- Uninterested behavior of USA, China and India in not respecting the Environmental Protocols will eventually lead the societies to a stage that the environmental concerns in energy generation will no longer be of their primary concern

Basic Conditions for Investment

The most basic condition for investment is the establishment of a suitable investment climate.

Basic Conditions for suitable investment climate;

- Realizing vertical unbundling in all levels; i.e. in functional, organizational, physical and ownership levels,
- Establishment of an Independent Regulatory Authority,
- Realizing third-party access,
- Realizing cost-based prices in wholesale market

Basic Conditions for Investment

- In most countries the regulatory authorities are subject to severe influence of political authorities, thus, weakening their independence,
- The most essential function the regulatory authority is to be able to liberate the electricity prices in the wholesale markets, in terms of competitive market conditions, with no influence of political authority,
- The political authorities in those countries on the other hand, generally tend to intervene the wholesale prices in the direction of their own political objectives, i.e. to lower the prices, in order to gain the sympathy of the society, and to fund the energy tariffs and projects from public resources at the expense of losing large public financial resources,

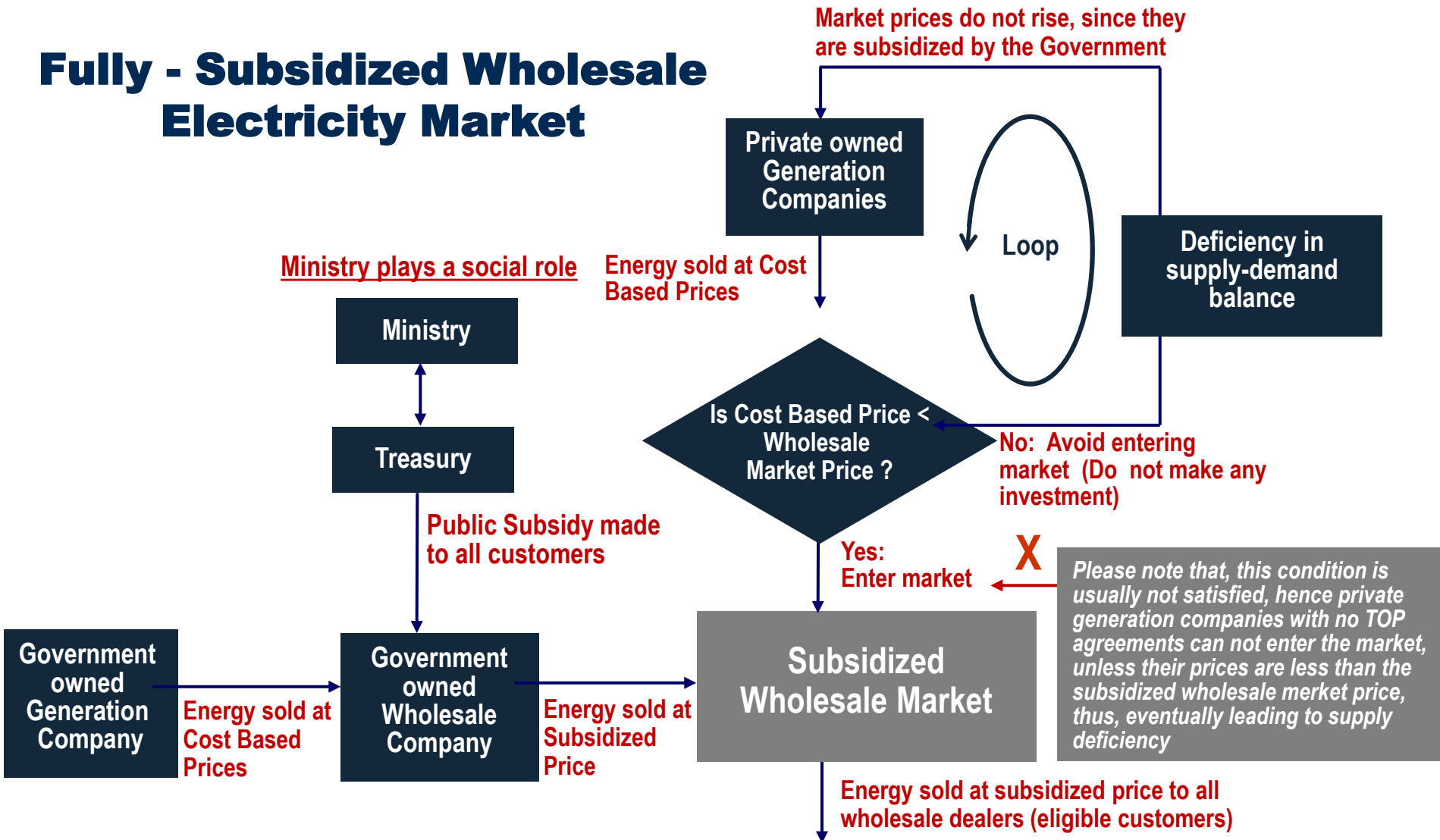
Basic Conditions for Investment

- This type of intervention however, eventually leads to an unsuitable environment and eventually to a financial breakdown, where investors find themselves with no possibility of making investment, as their projects turn out to be unfeasible, in terms of those prices, hence they cancel their investment programs,
- This intervention eventually leads to a condition that the government owned public wholesale companies become the largest entities in the market, governing and funding the wholesale prices, thus inhibiting the market liberalization completely,
- This happy period continues until the supply-demand balance turns out to be disturbed and new investments are urgently needed, and public resources are neither sufficient, nor available, while the prices are still kept at low level,

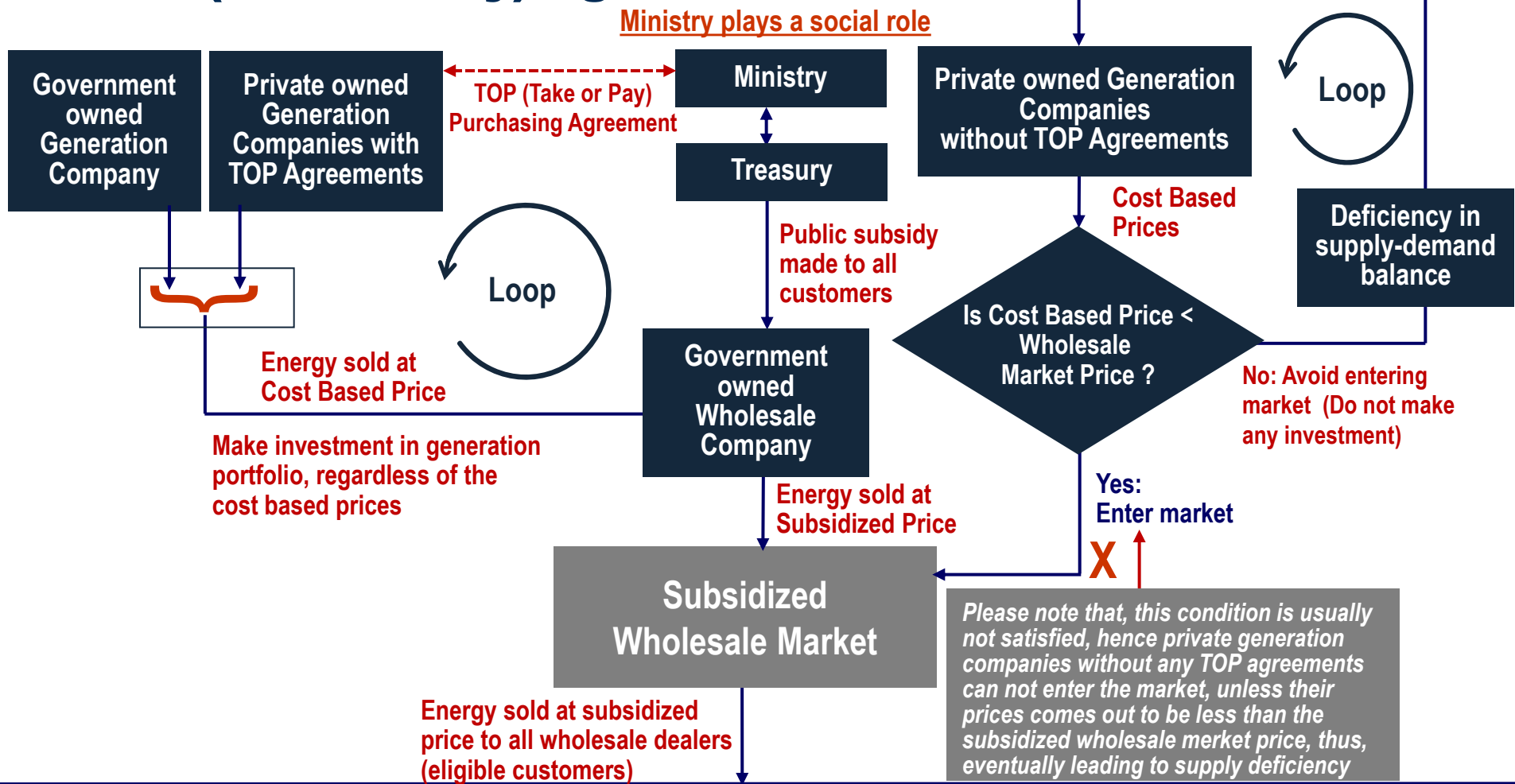
Basic Conditions for Investment

- Then the governments in those countries find themselves in a situation that no solution exists, except inviting foreign investments,
- Inviting foreign investment on the other hand requires the satisfaction of one of the following conditions,
- To agree to make TOP (Take or Pay) Agreements in case of insisting on continuing cheap electricity prices,
- or to liberalize the wholesale prices, thus leading to a completely liberalized market structure

Fully - Subsidized Wholesale Electricity Market



Wholesale Electricity Market with TOP (Take or Pay) Agreements



Competitive Wholesale Electricity Market

