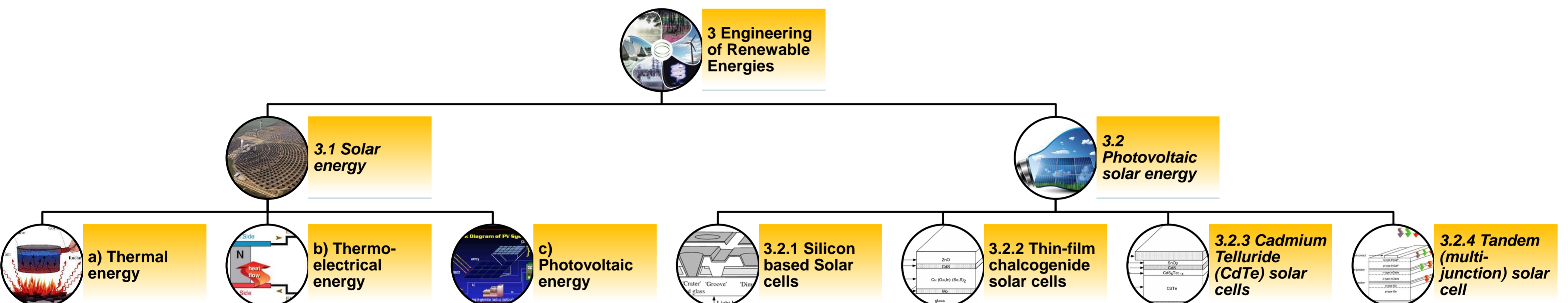


1 Introduction

The intensity and early development of photovoltaics make the Spanish situation unique compared to the rest of the European Union. In 2009, it alone provided 42% of European production (Fig. 2). The slowdown in Spanish production since 2010 and the boom in the sector in other European countries reduced Spain's share of solar PV to 10% of European production in 2013. At that time, photovoltaics accounted for 3% of total Spanish electricity production. Spain remains the third country in Europe for total photovoltaic capacity (Eurostat), with 4.6 GW in December 2014 (CNMC), most of which was installed in 2008 (3.3 GW) (CNMC).

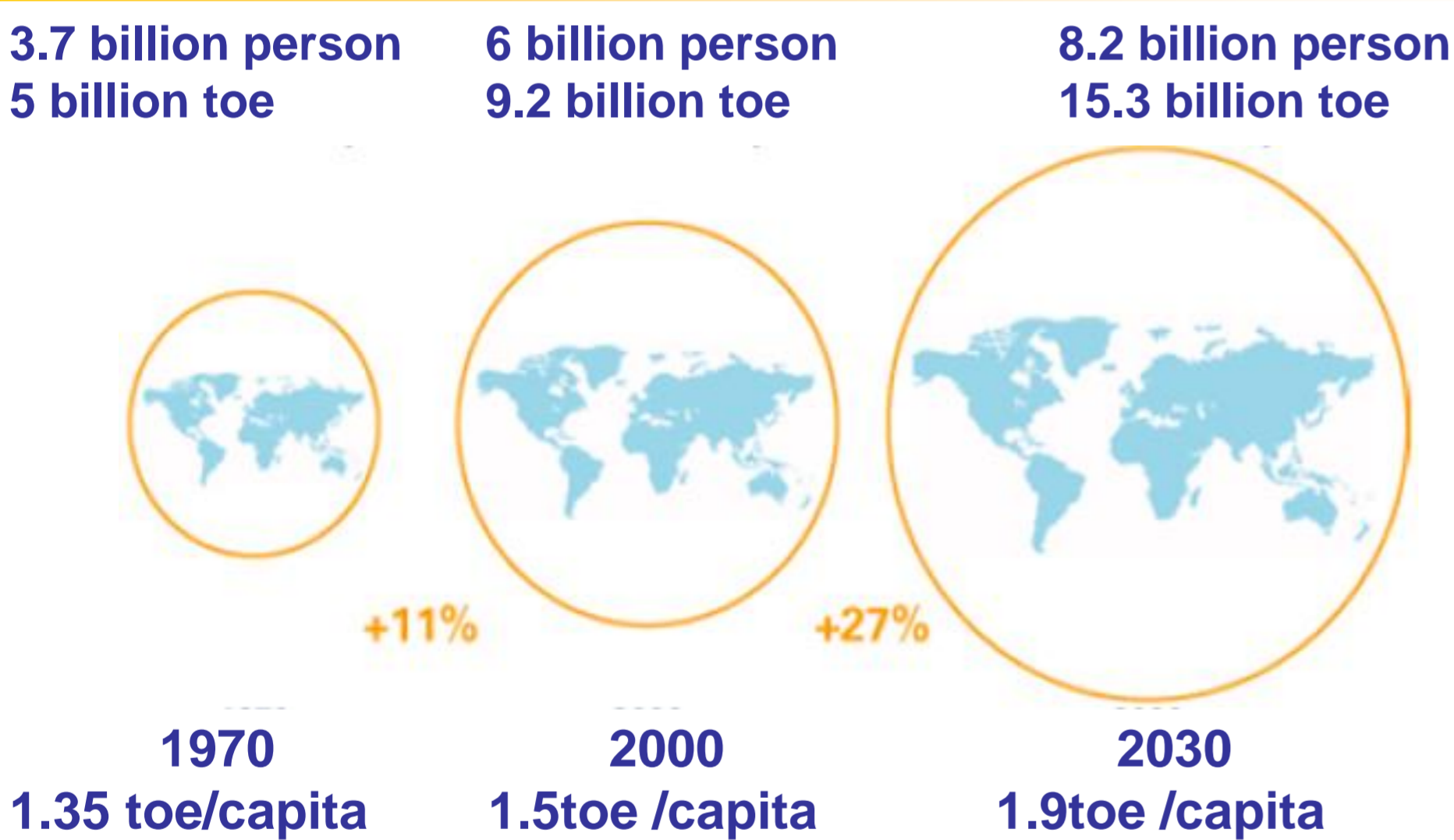
Since 2007, this sector has created a powerful industry with dominant positions in Europe for the manufacture of thin-film panels and silicon semiconductor equipment. However, beyond the overall economic performance, the sector is characterized by a heterogeneous development in time and space that results from the combination of several factors.

2 The different types of panels solars



4 The Global Engineer

4.1 Comparison of the evolution of the world population and the world energy consumption, per capita



4.2. Distribution of photovoltaic capacity in Europe in 2020

4.3 Evolution of photovoltaic production in the European Union

Renewables as a proportion of gross electricity consumption (%)

	Actual 1997	Indicative target 2010	Current policies		Advanced renewable strategy	
			2010	2020	2010	2020
Belgium	1.1	6.0	3.6	5.0	4.7	7.8
Denmark	8.7	29.0	29.0	31.6	37.7	55.9
Germany	4.5	12.5	13.0	14.8	16.3	20.2
Greece	8.6	20.1	15.0	15.5	16.5	22.3
Spain	19.9	29.4	26.1	26.6	31.2	33.2
France	15.0	21.0	17.9	18.8	19.6	23.1
Ireland	3.6	13.2	10.3	16.1	12.5	23.6
Italy	16.0	25.0	20.5	20.6	23.3	29.2
Luxembourg	2.1	5.7	4.7	4.5	5.3	6.2
The Netherlands	3.5	9.0	6.9	7.1	9.6	10.7
Austria	70.0	78.1	69.7	62.8	78.1	80.7
Portugal	38.5	39.0	33.1	35.6	37.3	42.3
Finland	24.7	31.5	31.3	34.9	32.9	41.4
Sweden	49.1	60.0	59.3	56.1	60.3	58.9
United Kingdom	1.7	10.0	7.3	9.9	9.5	22.5
EU-15 Member States	13.9	22.1	19.5	20.4	22.3	27.6

5. Methodological approach

By a documentary analysis. The study is based on the exploitation of statistics from official databases in Spain (Comisión Nacional de Los Mercados y la Competencia (CNMC)).

Energy source	Total Spain	Part Spain	Part Europe	For one Consumer Spain	For one consumer Europe
Fossil Energy	436,01 mia kWh	47,0 %	49,2 %	9.207,96 kWh	8.111,57 kWh
Nuclear Energy	64,94 mia kWh	7,0 %	7,0 %	1.371,40 kWh	1.153,75 kWh
Hydraulic Energy	129,88 mia kWh	14,0 %	24,1 %	2.742,80 kWh	3.975,34 kWh
Renewal Energy	296,86 mia kWh	32,0 %	19,7 %	6.269,25 kWh	3.272,88 kWh
Total production capacity	927,68 mia kWh	100,0 %	100,0 %	19.591,41 kWh	16.482,15 kWh
Total production reel	258,60 mia kWh	27,9 %	35,9 %	5.461,28 kWh	5.922,49 kWh

6. Conclusion

The sector is characterized by a heterogeneous development in time and space that results from the combination of several factors. More renewable energy use can have a positive impact on consumers' electricity prices during high fossil fuel prices. However, the question is if the renewable energy use in the EU as a whole is net beneficial throughout the oil price cycle with subsequently low and high prices of the fossil fuel mix for electricity generation. An additional use of renewable energy can be costly during the low fossil fuel mix prices but it can be beneficial during the high fossil fuel mix prices. Its balance is relevant for anti-cyclic policy making.