

World Champion in Environmental Sustainability – for How Much Longer?

Loner Helena, Mongelli Sara Tania, Williams Ruth
WiN Switzerland

Introduction

Thanks to its secure, affordable and environmentally sustainable domestic electricity supply, Switzerland has been rated at the top of the World Energy Council's worldwide environmental Sustainability Index. With electricity production based on hydro (58%) and nuclear (36%, in winter up to 45%) Switzerland has earned a Triple A Index in the Energy Trilemma (security, equity, sustainability). However, the Swiss pole position is at risk: Shortly after Fukushima the Swiss government made a U-turn and switched from nuclear new-build to a nuclear phase out.

Country ranking	Energy performance			Environmental Impact Mitigation			Social Equity			Energy Security		
	2014	2013	2012	2014	2013	2012	2014	2013	2012	2014	2013	2012
Switzerland	1	1	2	1	1	1	5	6	4	22	19	26
Sweden	2	4	4	6	6	8	19	14	21	20	24	18
United Kingdom	3	2	1	18	19	2	22	8	5	9	11	3
Canada	4	8	9	56	60	66	2	2	2	1	1	2
Austria	5	5	3	8	7	7	10	7	7	44	33	30
France	6	6	5	10	9	9	11	5	8	41	44	41
Denmark	7	2	5	9	10	19	47	25	34	6	3	5
Norway	8	9	7	5	8	6	15	10	10	45	51	44
Colombia	9	13	15	4	4	4	63	85	86	5	5	6
Finland	10	17	14	37	45	49	16	21	20	26	37	25
United States	13	15	16	83	86	88	1	1	1	8	12	17
Germany	14	10	8	27	30	31	42	11	13	27	31	24
Australia	18	20	21	98	97	99	3	3	3	10	10	14
Japan	22	14	13	41	33	29	20	17	9	62	48	49
Italy	34	25	26	21	24	22	48	34	29	70	69	76
Tunisia	42	35	29	57	56	59	58	57	55	36	28	15

Present Electricity Production in Switzerland

In Switzerland only about 3% of the power production is fossil based. For this reason Switzerland has a very environmental and climate friendly production. Since in winter the inland electricity production does not cover the consumption, Switzerland has to import electricity to fill the gap. But in summer the surplus production allows for exports.

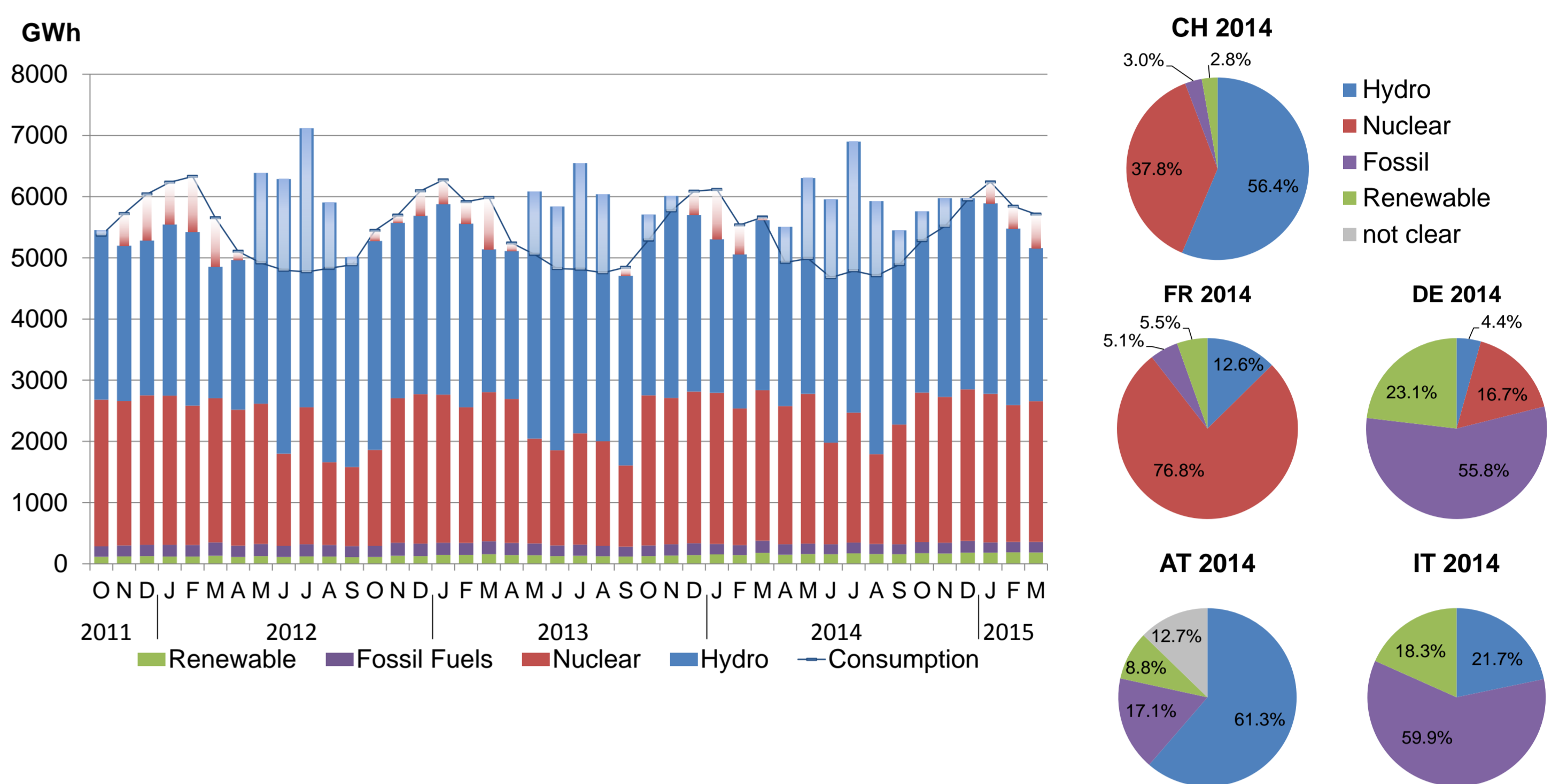


Figure 1: Power Production and Consumption over the last three years
Source: ENSTO-E* statistics

*ENTSO-E = European Network of Transmission System Operators for Electricity

Future Scenario for Electricity Production

New renewable energy is now meant to replace nuclear while energy saving and efficiency measures should reduce overall energy demand. At the same time CO₂-emissions are expected to be cut drastically: -50% off the 1990 level by 2045.

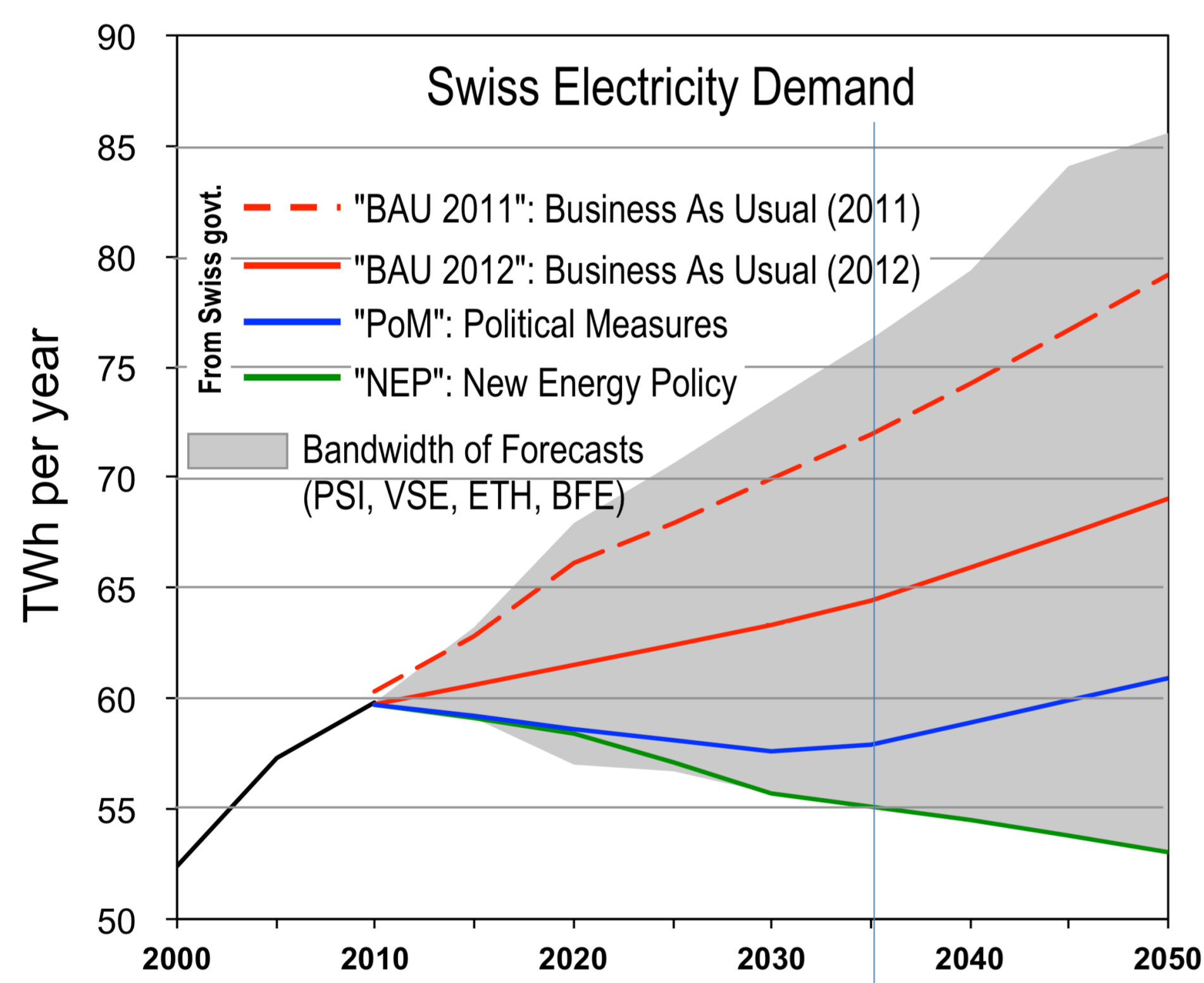


Figure 2: Bandwidth in assumed Swiss electricity demand trajectories to 2050 (Source: Federal Energy Strategy 2050; PSI, Laboratory for Energy System Analysis; VSE; ETH).

Facing the proposed nuclear phase out will mean to build gas-fired power plants and/or import base load from the European grid to secure supply given the intermittency of renewable power generation. Both options will torpedo Switzerland's climate protection goals and ignore the Swiss population's explicit will to maintain a high degree of autonomy in power production.

Readjusting and expanding the distribution and transmission grid for solar and wind production will also take big investments. Thus, the costs for the whole energy transition will amount to more than 100 billion CHF. Drastically reducing electricity consumption (-13% off the 2010 level by 2035) as well as CO₂-emissions, while the Swiss population continues to grow steadily (+25% by 2045), is unrealistic.

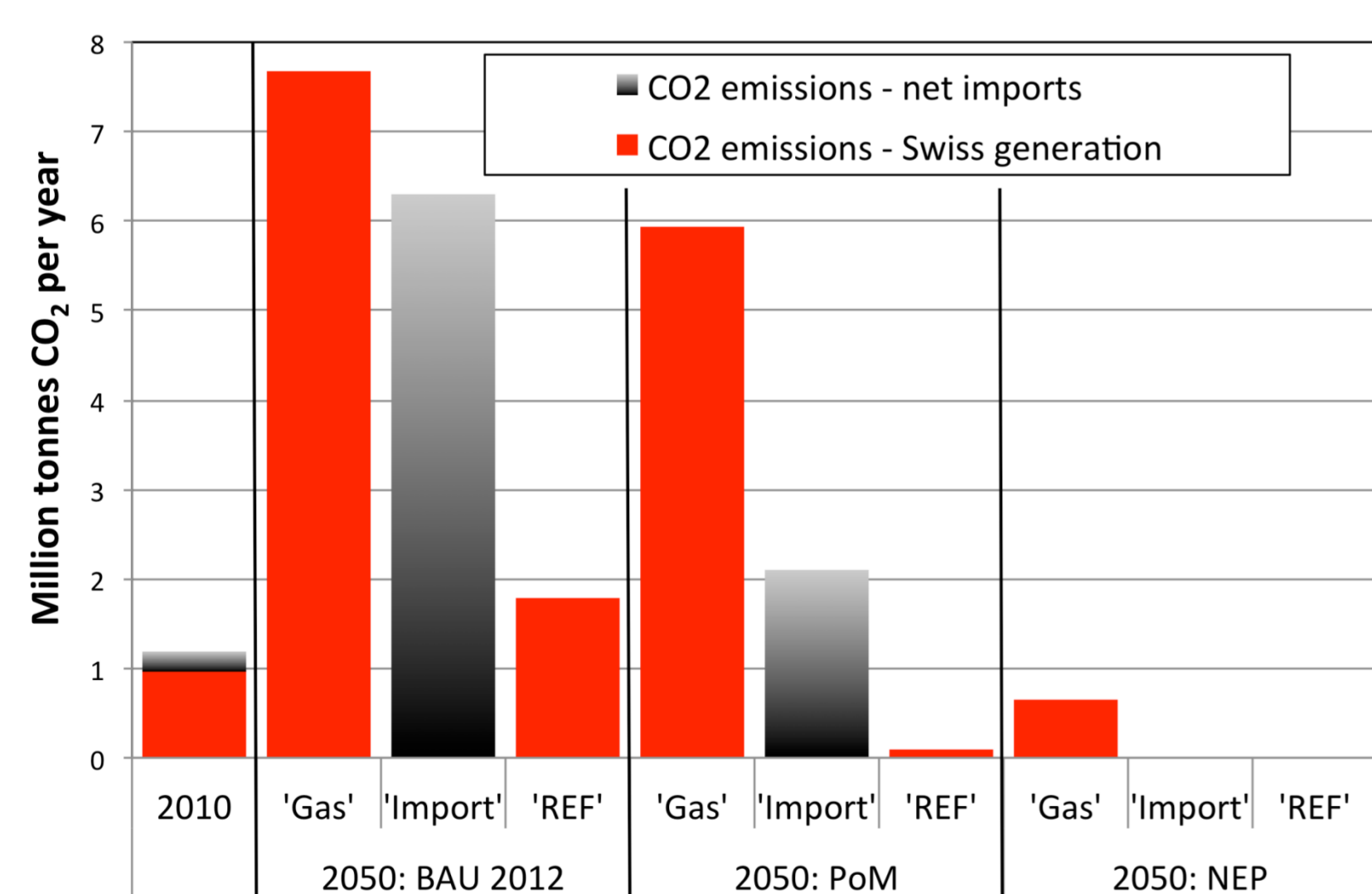


Figure 4: Direct greenhouse gas emissions from the Swiss electricity supply per year, depending upon the development of the electricity demand (compare with Figure 2).

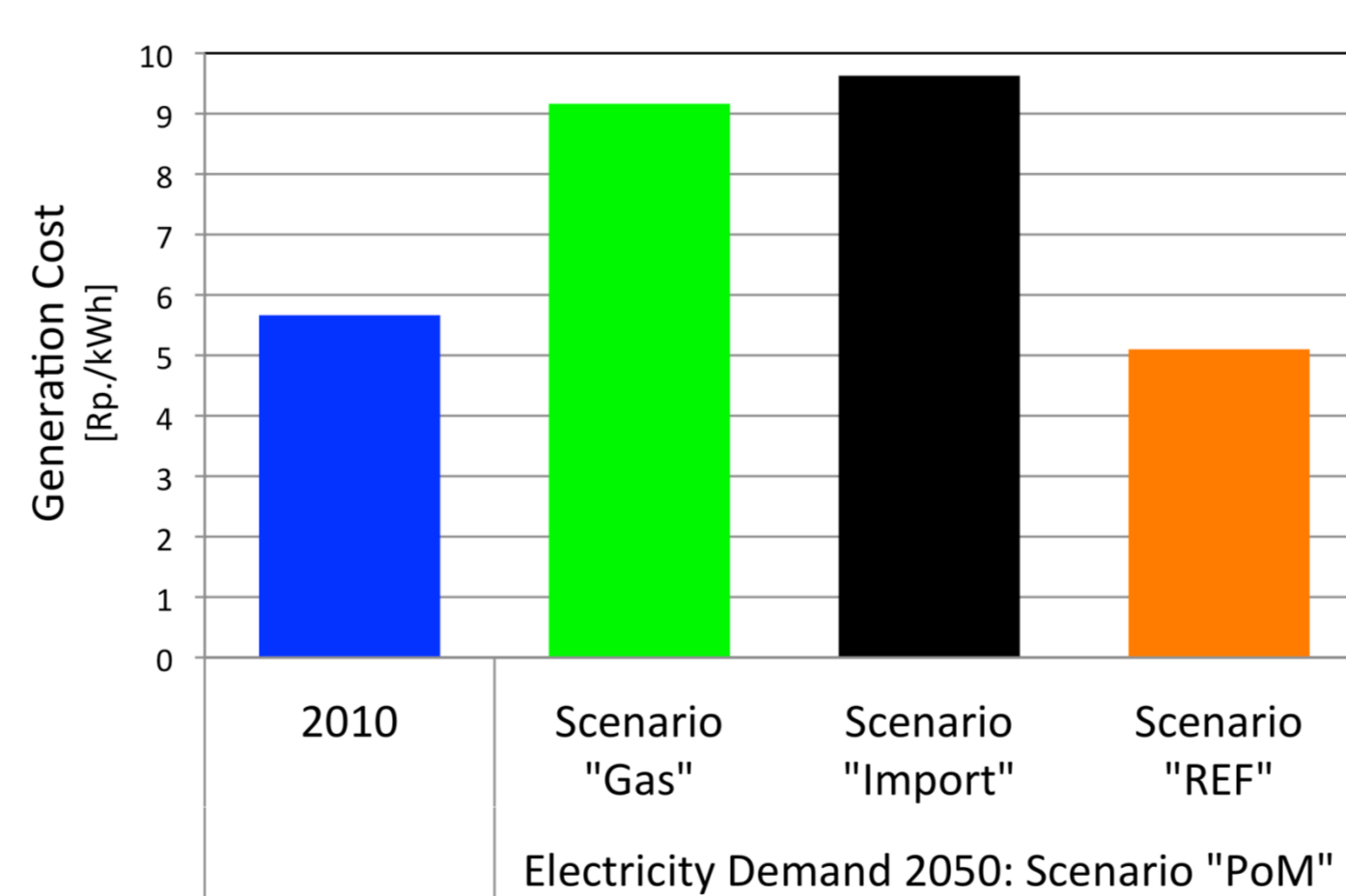


Figure 5: Generation cost of a kilowatt-hour of electricity in the three scenarios on average in the year 2050. The profits from electricity trading are included here.

Figure 3 shows the Swiss Government's current scenario for the 2035 electricity production and consumption in the frame of the new energy policy. All new renewable potentials are realized. Still, the massive gap between production and consumption during 8 months a year will have to be covered by imports and/or gas fired power plants.

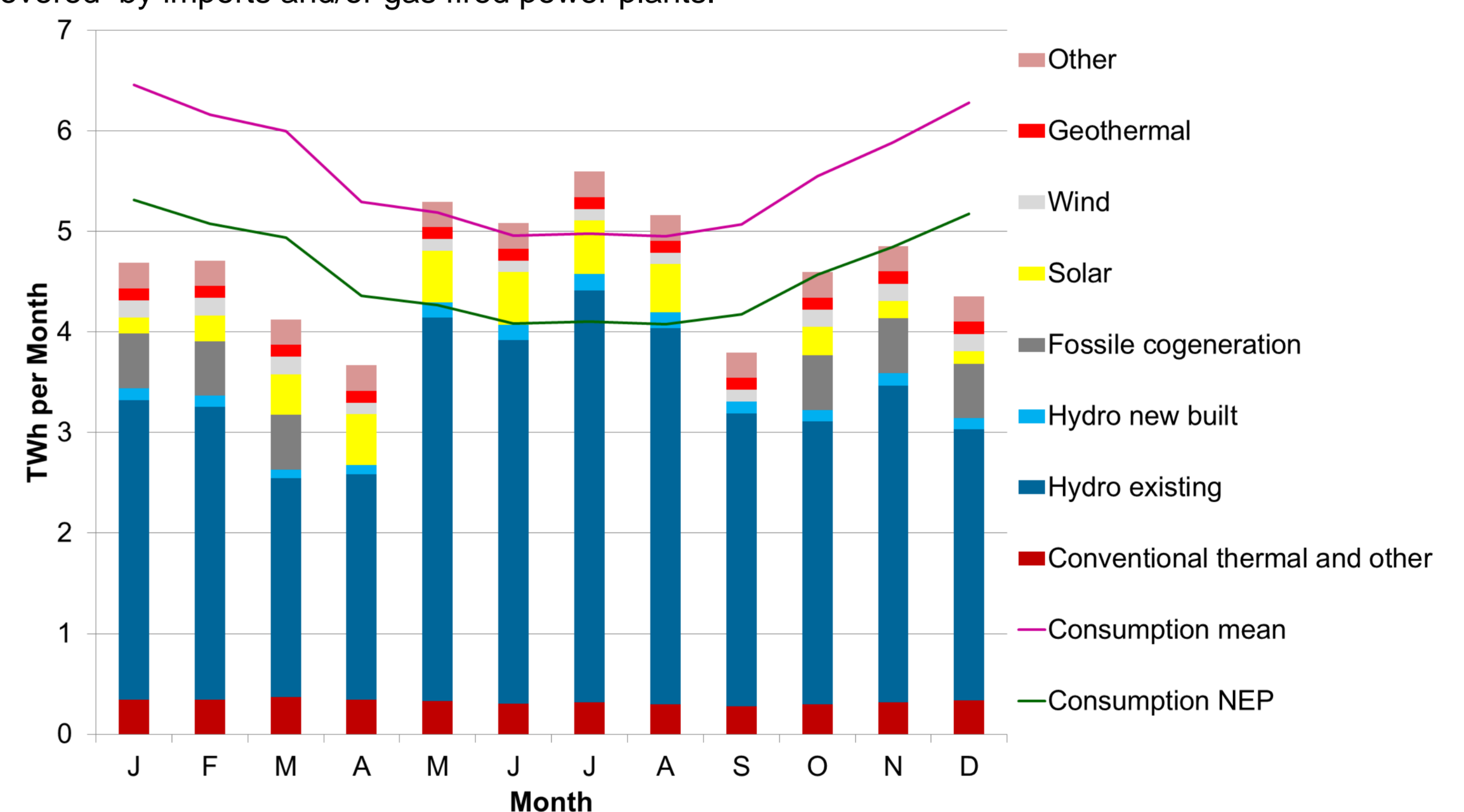


Figure 3: Energy production and consumption in 2035. The green line shows the predicted consumption with NEP, the pink line corresponds to a mean value of the grey prediction area in Figure 2 (= growth of 0.3% per year).
Source: Data from Federal Energy Strategy 2050

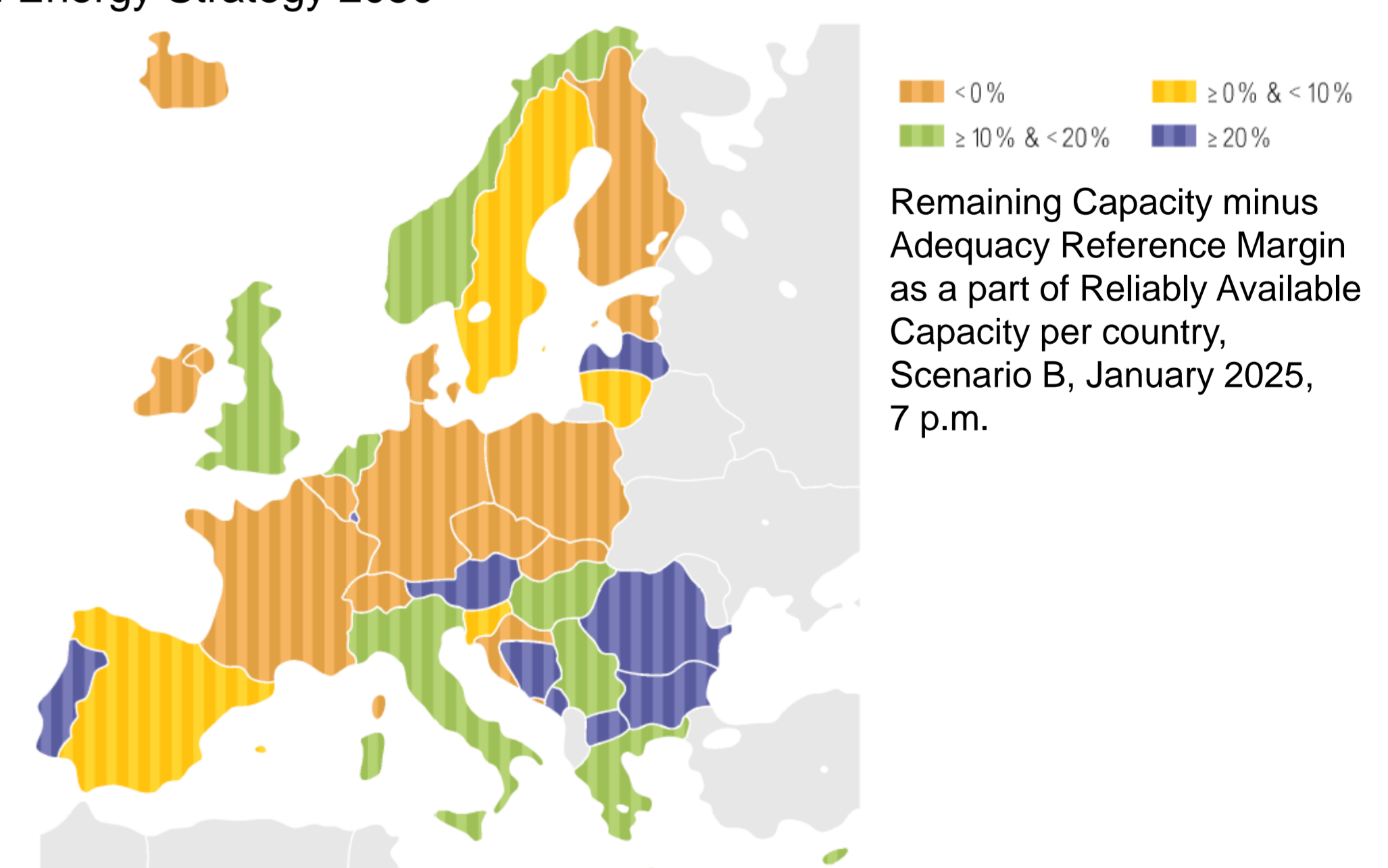


Figure 6: Remaining Capacity, January 2025, 7 p.m.
Source: ENTSO-E*, Scenario Outlook & Adequacy Forecasts 2014–2030

Conclusions

The unavoidable gap resulting from the country's electricity needs on one hand and the domestic production without nuclear on the other hand cannot be filled by unreliable stochastic energy as suggested by the Swiss government's roadmap "energy strategy 2050". We are convinced that the roadmap proposed by the Swiss government will endanger the currently secure, affordable and environmentally sustainable energy system of Switzerland.

Acknowledgements

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Our Goal

We want to raise our voice to the Swiss energy minister with a petition signed by as many WiNners as possible.