Photovoltaic's policy in Switzerland: short presentation of the legal framework.

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Summary

1. The photovoltaic's policy goals before and after Fukushima
2. The legal framework and structure of electricity supply
3. The national feed-in tariff and its waiting queue for photovoltaic
4. The local and de facto alternatives
5. Long-run perspectives

1. The photovoltaic's policy goals before and after Fukushima

Before Fukushima:

- Solar Power was thought to produce around 1% in 2030 (but 5% to 6% 2050).
- Main governmental objective: two big nuclear power plants.

New governmental Strategy after Fukushima:

Switzerland will progressively fade out nuclear power by

- stabilizing power consumption thanks to efficiency.
- Replacing 40% nuclear power by renewable.

In the governmental strategy, Photovoltaic is now supposed to produce **4% of electricity by 2030, 17% by 2050.**

Swissolar opinion:

Good, that the Government finally acknowledges the effective PV potential in Switzerland. **But: reach 20% Photovoltaic by 2025 ,** photovoltaic on roof's top is the easiest way to enhance power production.

2. The legal framework and structure of electricity supply

- **High voltage transportation lines**: public corporation “Swissgrid”
- **Distribution network**: around 800 companies, each of one with local monopole zone. Overwhelmingly public property by Cantons (=provinces) or municipalities.
- **Network:** free access for third part, costs covered by a fee on every KWh, Prices controlled by the Eletricity regulator (“Elcom”).
- **Liberalized wholesale market**
- **For all other consumers**: power is sold by the distribution network (legal monopole), to a regulated price
- **Production hydro & Nuclear**: bigger distribution companies (owned by cities or several cantons)
- **Green tradable certificate for renewable electricity**
- **Full liberalization for all consumers?**: theoretically by 2016

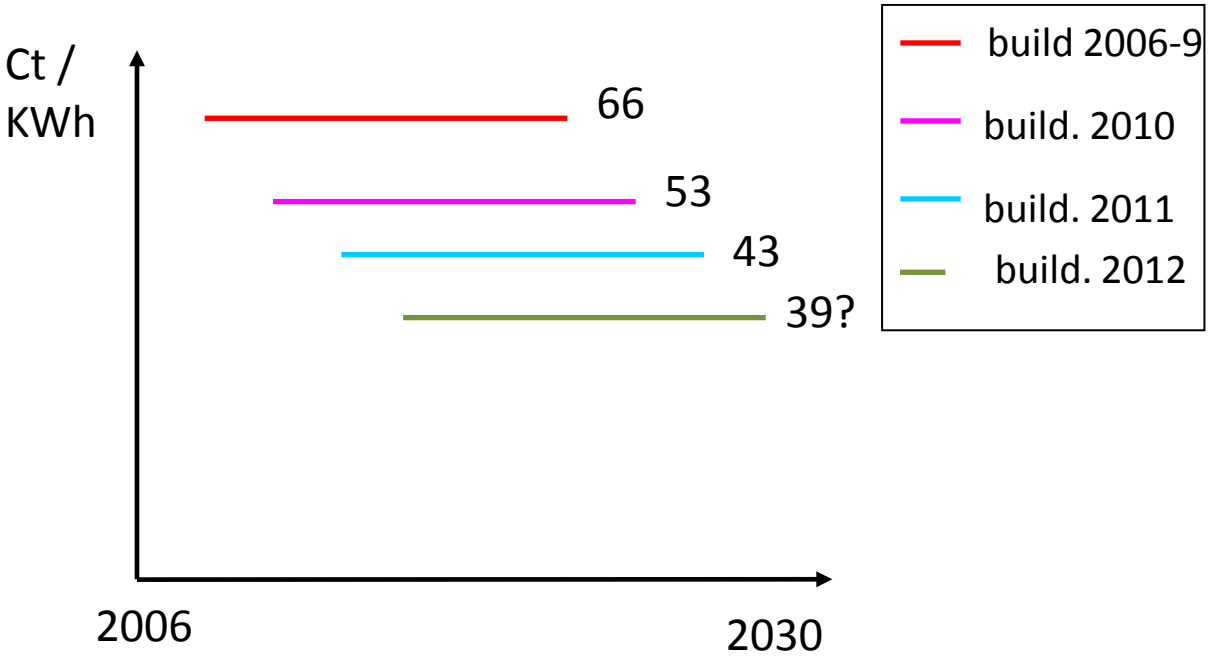
Economical situation:

- Most installations are old and there a huge modernization need for production and network. Power from new plant is more expensive:

- Production cost from existing power plants: between 2 and 10 CH-cent by KWh.
- Production cost from new power plants:
  - hydro and wind 15 to 25 cent by KWh,
  - Biomass 15 to 35,
  - photovoltaic 30 to 50, strongly falling down. N
  - Nuclear: no recent plant, estimation from 5 to 20 or more (highly controversial).
- Necessity of incentive framework of investment in production (problem of sunk cost, long run amortization, dumping strategy by incumbents)

3. The national feed-in tariff and its waiting queue for photovoltaic

- Tariff guarantee
- Covering all cost
- Investment security
- Decreasing tariff every Year for PV (and wind).
- Only produced KWh is paid (unlike investment subsidies)
- Incentive for producing
- German model ismost effective



Exemple

→ photovoltaic Plant build from 2006 to 2009: on roof top ,10 to 30 KW: 66ct for 25 year.

→2010 PV plant build : 53 (-18%)

→2011 PV plant build : 43 (-18%)

→2012 PV plant build : 39 (-8%)

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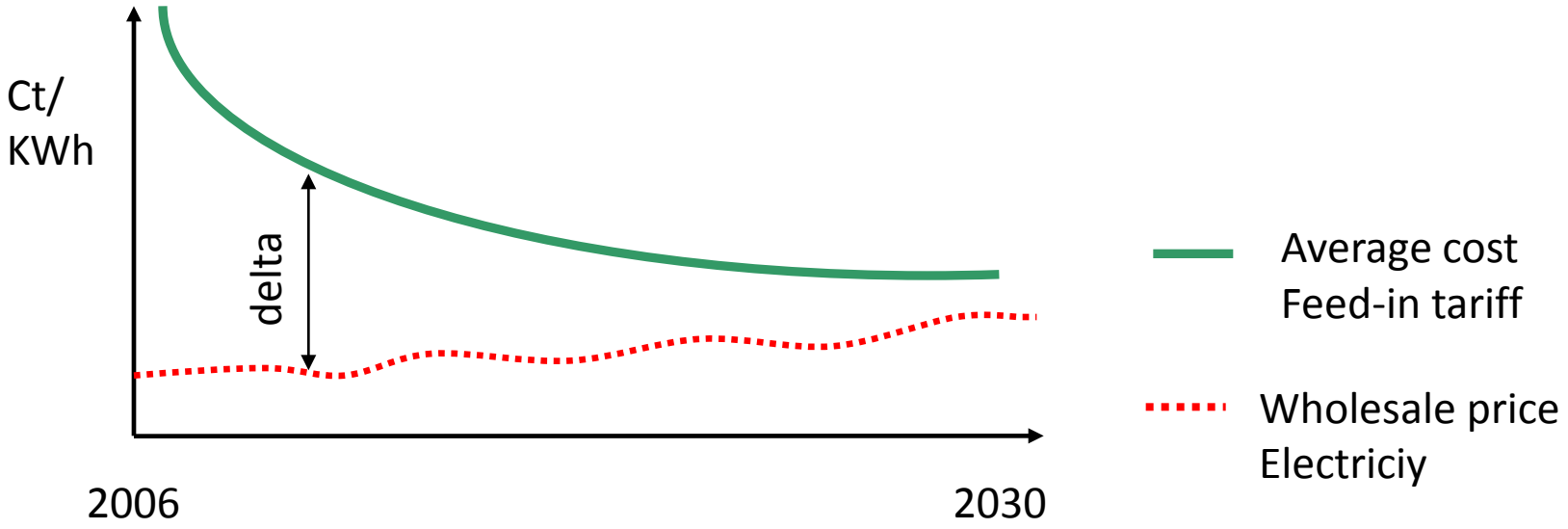
Goal of feed-in tariff:
make renewable completive, thanks to industrialization and economy of scale.



Characteristics of the Swiss feed-in tariff:

- The High-voltage public company “Swissgrid” is managing the system.
- The is covered by a financing fee charged on every KWh sold in the Switzerland. But the financing fee is limited by law(the pre-Fukushima policy).
- Special limitative quota for photovoltaic.
- Therefore, waiting-queue : over 8000 photovoltaic plants are still waiting. After Fukushima: 1000 new inscription every month
- The system is blocked for new plants since available money will be fully engaged.
- Conclusion: the financing fee has to be substantially increased if Switzerland wants to switch from nuclear to renewable electricity (Unproductive stop-and-go policy)

4. The local and *de facto* alternatives

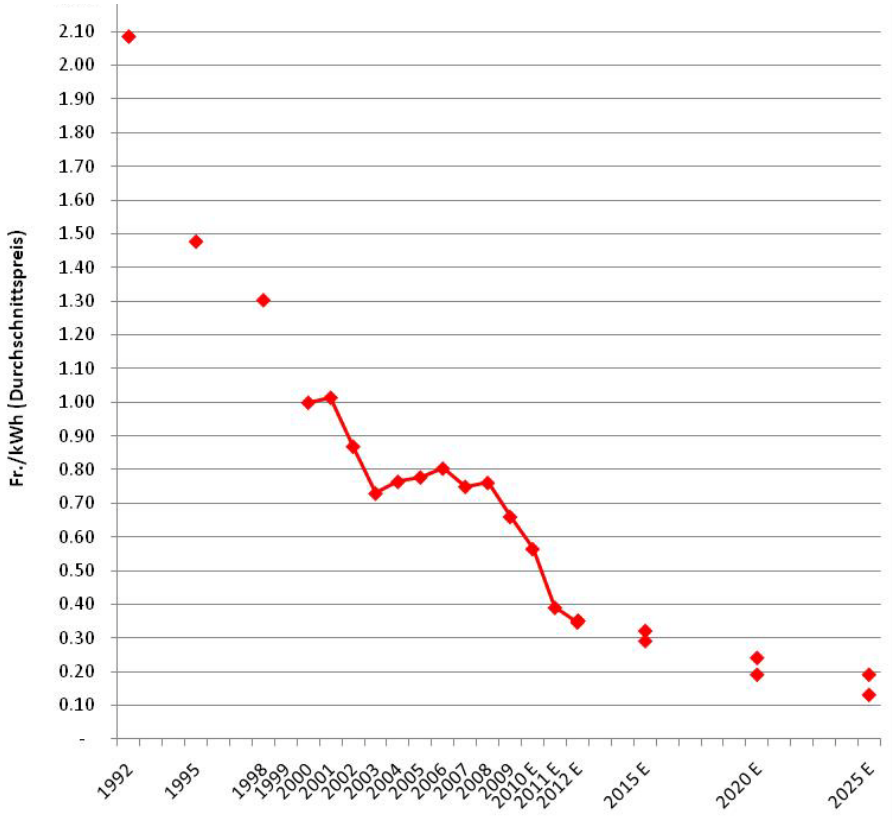
Facing this blockage of the national feed-in tariff system, the local actors are experimenting alternatives:

- local feed-in tariff (mostly limited in volume and prices), as a supplementary system to the blocked national system. It can be financed by local budget, by local fee charge on electricity or so-called by “solar stock exchange”
- Some private individual with idealistic motivation invest
- Industrial or services company with high power consumption invest on their own roof to use themselves the electricity in real time.
- For micro-photovoltaic (under 3 KW), net-metering is allowed

Newest trends

Cost of Solar Electricity in Switzerland

Données jusqu'en 2009: IEA PVPS, dès 2010: Estimation Swissolar



- Local distribution companies **invest themselves** in order to become more self-sufficient. They are allowed to charge the cost of photovoltaic energy in the electricity regulated price for the consumer (in the not-liberalized segment).
- Next? **Hypothesis of a fast lane with low cost**: reactivating the old obligation for network to accept injection of renewable power and to pay for it "the market price of equivalent energy". Attractive in combination with income tax abatement.

5 Long-run perspectives

The rise of photovoltaic energy and its price breakdown is hardly compatible with a spot-market organization: if the sun is shining almost everywhere, there is a lot of electricity and price is down, close to zero.

As a consequence, most of the photovoltaic KWh would be paid nearly zero. Therefore, even at the moment where cost of photovoltaic power will be close to the market, a guarantee system will be necessary.

For instance:

- Long-duration contract between producers and distributors
- Feed-in guarantee at wholesale price.
- Priority for stochastic renewable energy: obligation to shut down Gas, Coal and nuclear plant when there is enough wind, sun and water (run-of-the-river hydroelectricity).
- Enhance short-run and seasonal storage, in order to enhance market value of surplus electricity (Switzerland already has this advantage with lots of dam and Pump-storage being enhanced)

Thanks for your attention

If you can read French or German:

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