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PRIVATBANK

New financing options and self-consumption

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EU-PVSEC

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Notenstein – a forward-thinking Swiss private bank

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- Specialised in wealth management and advisory services for institutional and private investors
- Our core offering is sustainable investments
- Limited company owned by Raiffeisen Switzerland (cooperative)
- Successor to Bank Wegelin & Co. Private Bankers, founded in 1741
- Well established with 12 branches throughout Switzerland and 700 employees
- Client assets under management: around CHF 21 billion, of which CHF 3.3 billion in the institutional clients business unit



"Germany Energy Minister proposes cuts to renewable subsidies."

Bloomberg, Jan 20, 2014

"Italy's retroactive PV cuts are theft."

PV-Tech, Jul 03, 2014

"Spain cuts to renewable energy subsidies will leave many project developers facing bankruptcy."

Bloomberg, Jul 17, 2013

"Czech Government votes to end support for renewables from 2014."

Bloomberg, Jul 26, 2013

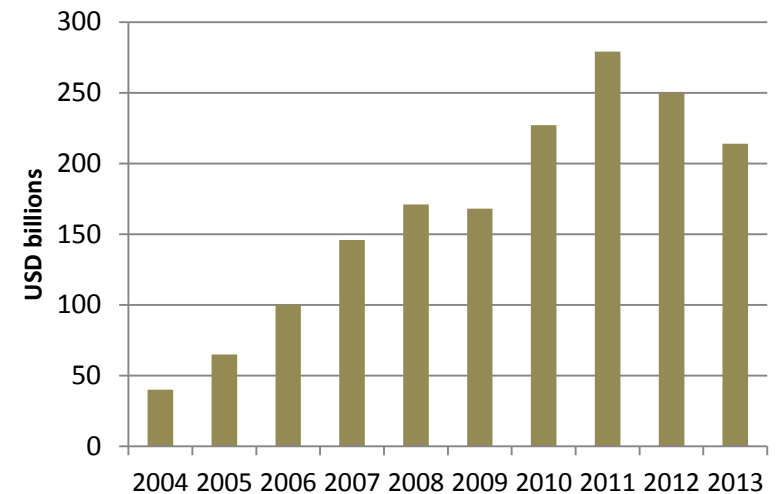
No solar investor could risk ignoring the threat of retroactive taxes and regulatory measures !

The ultimate goal: Solar must survive without subsidies

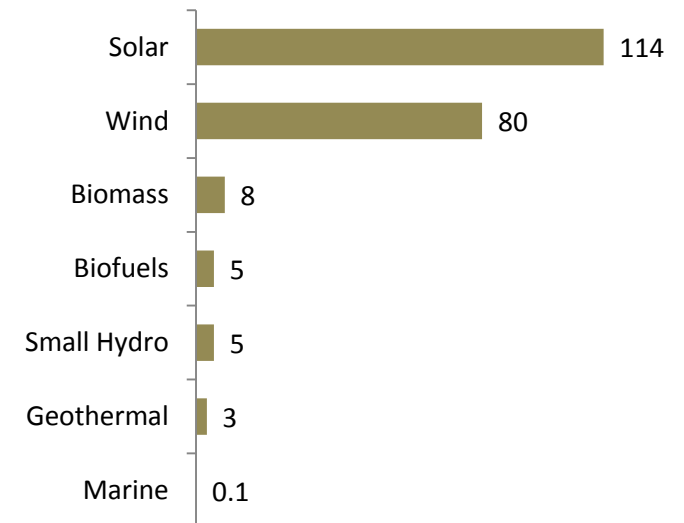
Investments in Renewables

- **Facts:** Since the peak in 2011 investment dropped by 25% to USD 214 bn, back to the level before 2010. In 2013 USD 114 bn was spent for solar (53%)
- **Goal:** IRENA (Intl. Renewable Energy Agency) stated that USD 550 bn of investment is needed every year till 2030 to secure the transition to sustainable energy and to keep below a 2° C rise in global temperature
- **Growing challenge:** financing of Renewables in the end use sector, i.e. decentralised solar at the consumers place

Global Investment in Renewables



2013 Investment by Sector



Beyond subsidies - new drivers are needed

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- Booming times for long-term investments follow Eldorado-phase of module producers and installers
- New support schemes switch from kWh-based payments (feed-in tariffs) to a single contribution for the initial investments (e.g. Switzerland) or net metering
- These new facts stimulate a high degree of self-consumption.
- Attractive financing options:
 - YieldCo for large-scale PV
 - New financing solutions for home owners



New investment form – the YieldCo concept

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- A Special Purpose Vehicle (SPV), legally separated from the solar developer, eliminating bankruptcy risk
 - Offer low-cost finance for developers and returns between 6 to 8%. This attracts institutional investors such as pension funds and insurance companies
 - YieldCo's are a sign of solar's growing maturity
 - "Post-subsidy age" characterised by steady investment rather than "boom-and-bust" spending
 - E.g. TerraForm (spin-off from SunEdison), NRG Yield. SunPower and FirstSolar also evaluating YieldCo.
- YieldCo concept especially suitable for utility scale PV-systems



Financing options for home owners

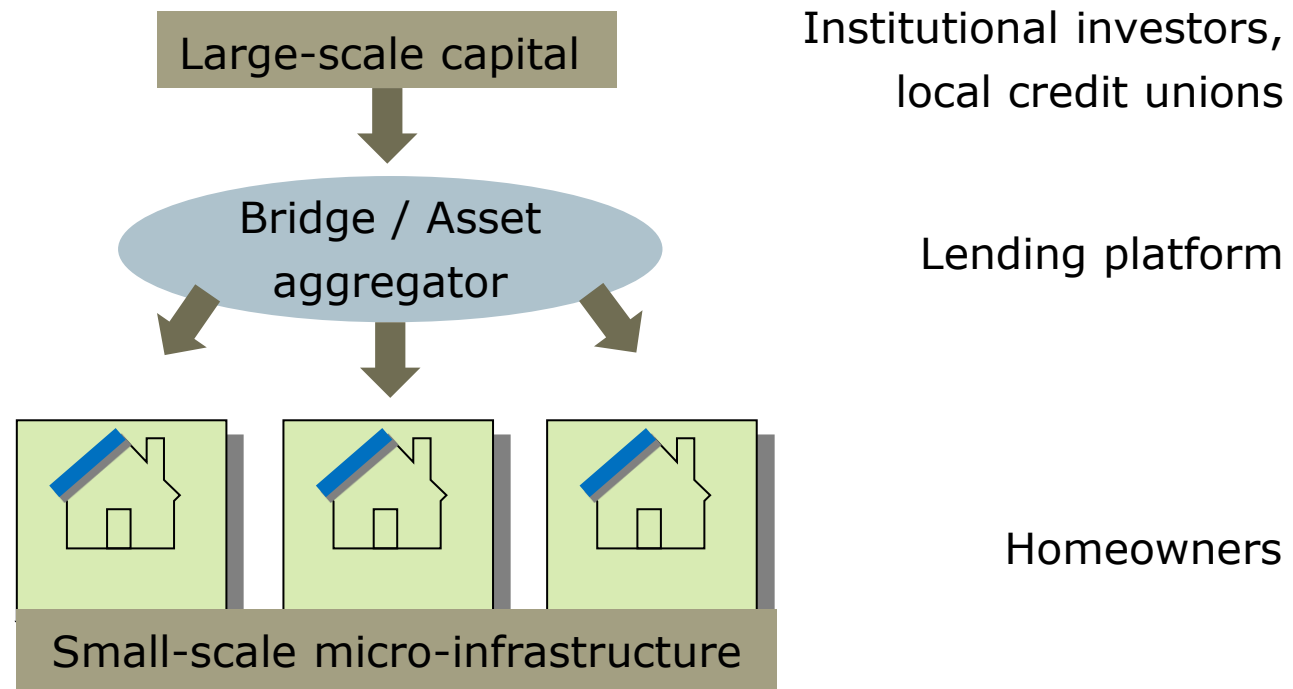
Simple financing options:

- **Lease:** Investor owns the system on your roof, you pay a monthly rent and you can use the energy you produce. Lease plus remaining electric bill is lower than before. Guarantee for 20 years, if something breaks they'll fix it
- **Loan:** You own your system. Over time you repay the loan on a monthly basis. Loan payment and remaining power bill is less than previous bill. You keep the solar tax credits and any other local incentives
- **Purchase:** own the system and the energy right from the beginning.



- Trend from 3rd party ownership of residential PV-installations to direct ownership via loans. 3rd party ownership will peak in 2014 at 68%
- Moving away from lease & PPA model to solar ownership
- Residential PV market will exceed 1 GW in 2014 for the first time

Examples: Dividend Solar, Solar City, Sunrun, Sungevity, Solar Universe



- Solar Investments in the past were mainly financed by state owned companies, provincial and local governments
- All infrastructure debts accumulates to more than USD 3 bn
- Now government wants more private investments. China wants to open the infrastructure and energy sector for private and foreign investments
- Share of decentralised PV-projects is increasing as they are easier and faster to install



Solar and storage = increased self-consumption

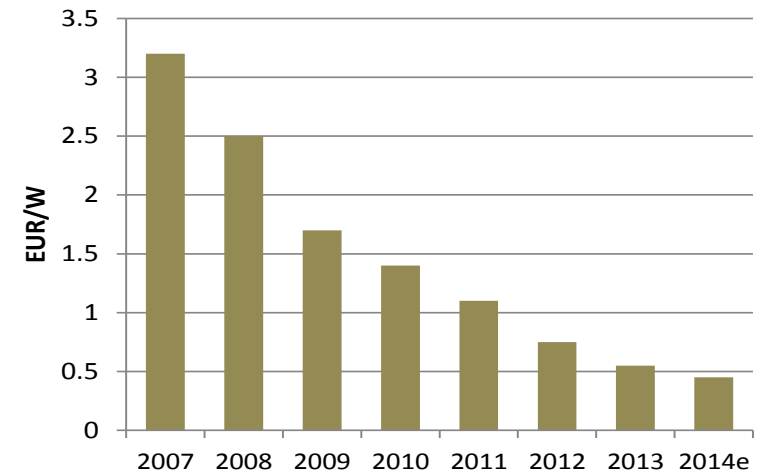
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- Don't rely on Feed-in tariffs, become your own solar power generator
- Declining battery and solar system costs will allow new applications
- Solar+battery+electric vehicle soon with a payback of 7-11 years
- PV-generated power coupled with storage presents a long term disruptive risk to utilities

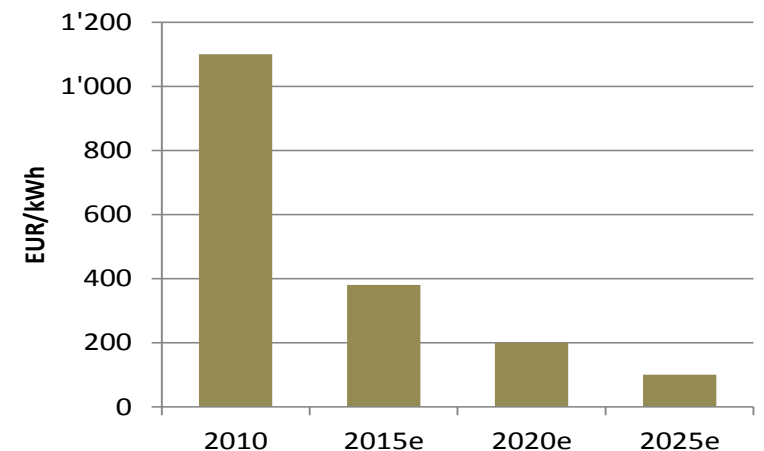
- Steven Chiu, former US energy secretary said (2013):

"It is possible to envisage a situation in 5 to 10 years where home owners could be 80% 'self-sufficient' and off-grid with USD 10'000 to 12'000 for a 'solar-plus-battery' system"!

Solar panel prices since 2007



Decline of lithium battery cost >50% by 2020



The new role of energy utilities

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- Utilities need to respond by applying new business models to prepare for the time of cheap solar power and falling prices of residential storage batteries
- How to win and convince the utilities? Some perceive net metering as lost revenue opportunities. In fact net metering creates a smoother demand curve for electricity and allows utilities to better manage their peak electricity loads
- Reduces strains on distribution system and shortens losses in long-distance transmission and distribution
- In the US 43 states plus Washington DC and 4 Territories have already adopted a net metering policy



How to increase self-consumption

- Residential PV-system: Production and consumption have a normal time overlap of up to 30%
- With a battery storage and an energy manager self-consumption can be increased up to 70-90%
- Knut battery **5,5 kW for 10'000 EUR**; 7'000 load cycles (15-20 years)
- Emergency power

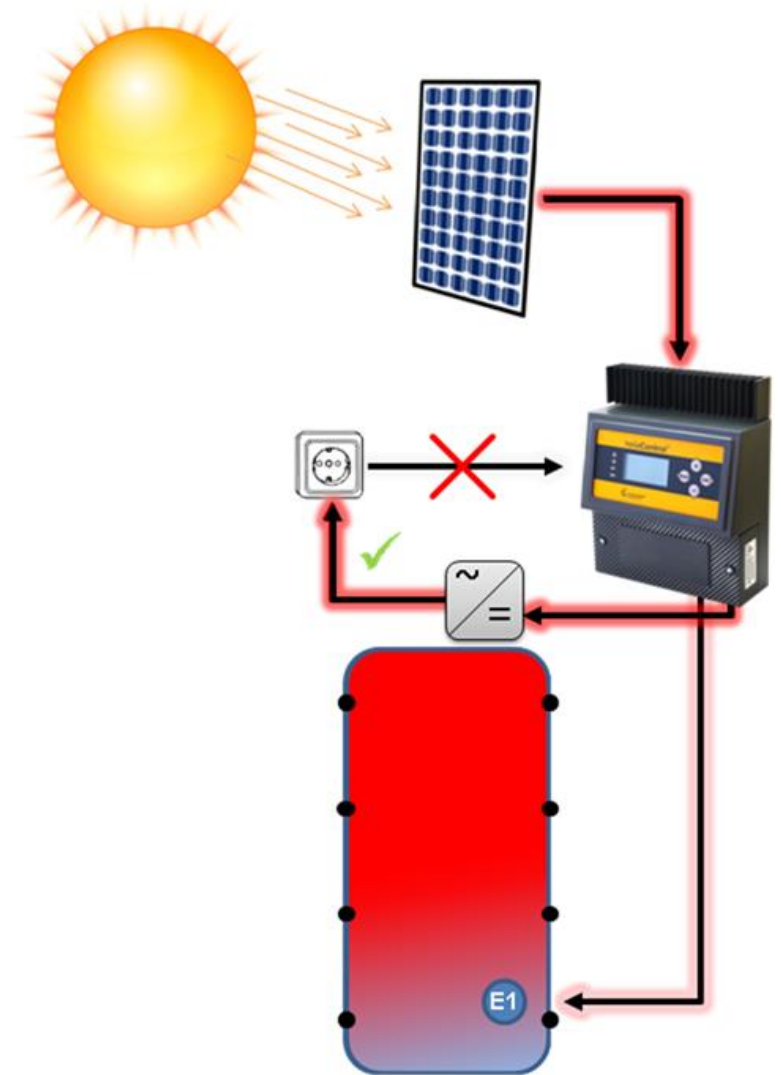
- Advantages for the local utility:
 - Lesser load on the local grid
 - Reduces peak demand (peak shaving)
 - On demand back-up power



Paradigm shift – PV power for hot water

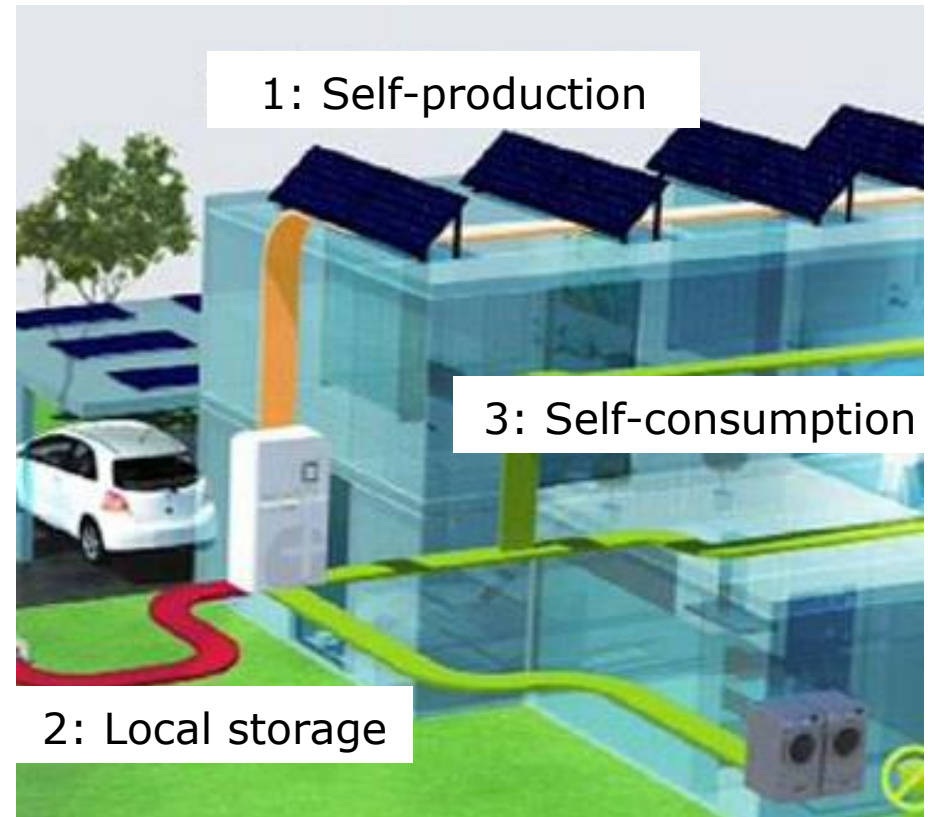
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- Replacement of a solar thermal system with new product SolvaHeater/SolvaControl
- Inexpensive solution, about **half the cost** of conventional solar thermal system
- Longer life span
- Easy installation, low maintenance
- Surveillance with laptop or App
- Advantage at low ambient temperature
- Active at all boiler temperatures
- No extra pump, no noise



Conclusion

- Post FiT-era offers new opportunities for competitive decentralised solar power and storage
- New attractive financing options, even without FiTs. Finance industry is adapting to the new conditions
- Growing appetite of institutional investors
- Higher energy independence for small companies and homeowners
- Optimised power/energy management could be linked to battery of electric vehicle or combined with the heating system of the house
- **Self-consumed PV-power will gain market share and become a common approach in many markets**



Many thanks for your attention

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