



Photovoltaic system and components price development in the Netherlands

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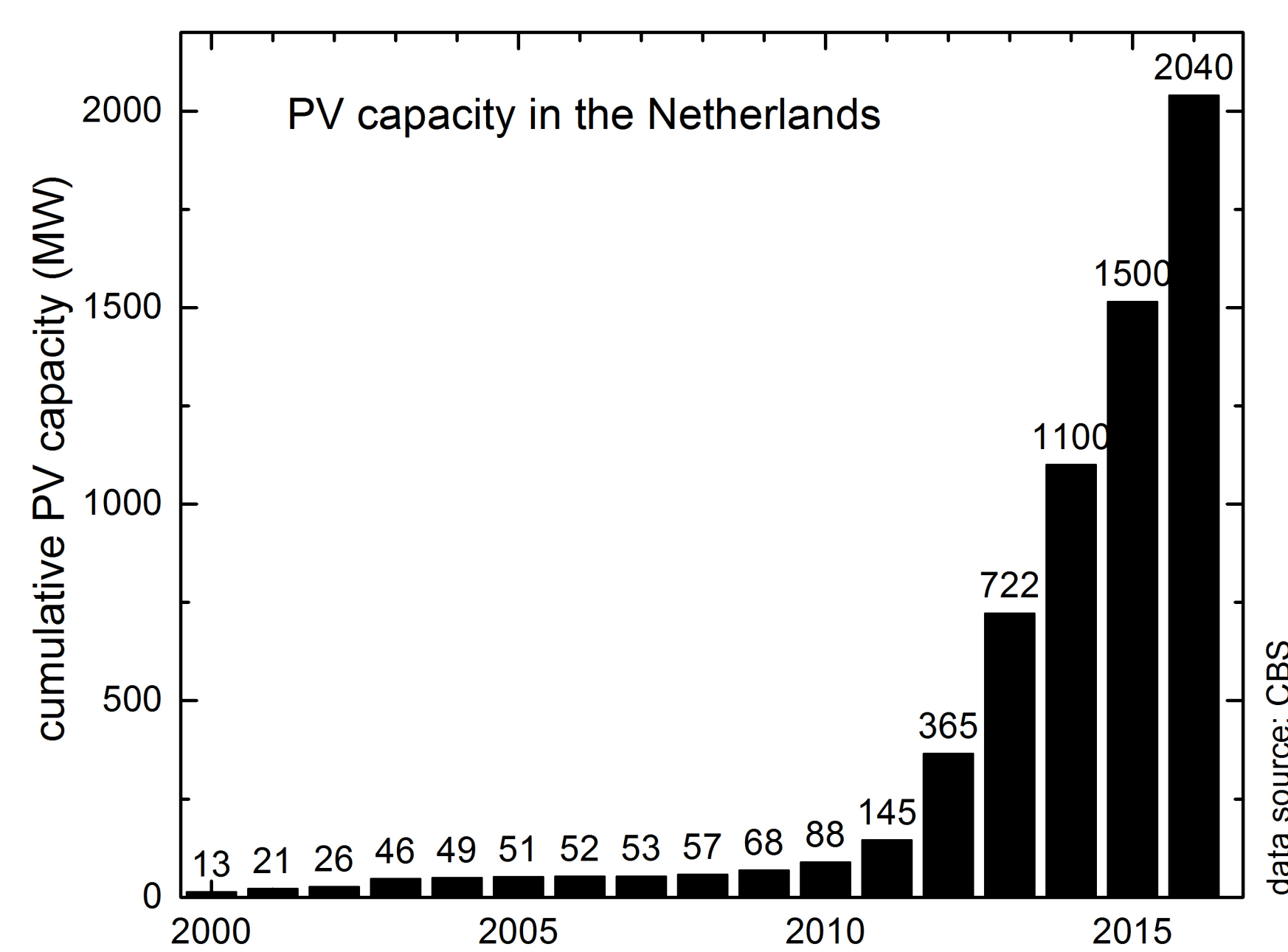
Introduction

The Dutch photovoltaic (PV) market has been growing very fast in the past years, with 2 GW installed capacity at the end of 2016.

Market research to assess the development of the cost of modules, inverters, and complete systems has been performed since October 2011 [1,2].

Average selling price of modules, inverters, and systems decreased considerably, predominantly in the year 2012.

Here, we provide an update, status end 2016, based on publically available data. Note: data is *including* VAT.



Market status December 2016

PV modules	October 2011	December 2016
Average price	2.28 €/Wp	1.109 €/Wp
Average capacity	140 Wp/m ²	151 Wp/m ²
# modules	166	1348
Technology	c-Si (mono/poly)	52% c-Si, 43% p-Si, thin film

Inverters	October 2011	December 2016
Average price	0.45 €/Wp	0.29 €/Wp
EU efficiency	95.1%	96.1 %
# inverters	98	777

Systems	April 2012	December 2016
Average price (ex installation)	tilted: 1.63 €/Wp flat: 1.67 €/Wp	tilted: 1.32 €/Wp flat: 1.39 €/Wp
# systems	tilted: 1557 flat: 1477	tilted: 24234 flat: 24234
Average installation	0.40 €/Wp	0.34 €/Wp

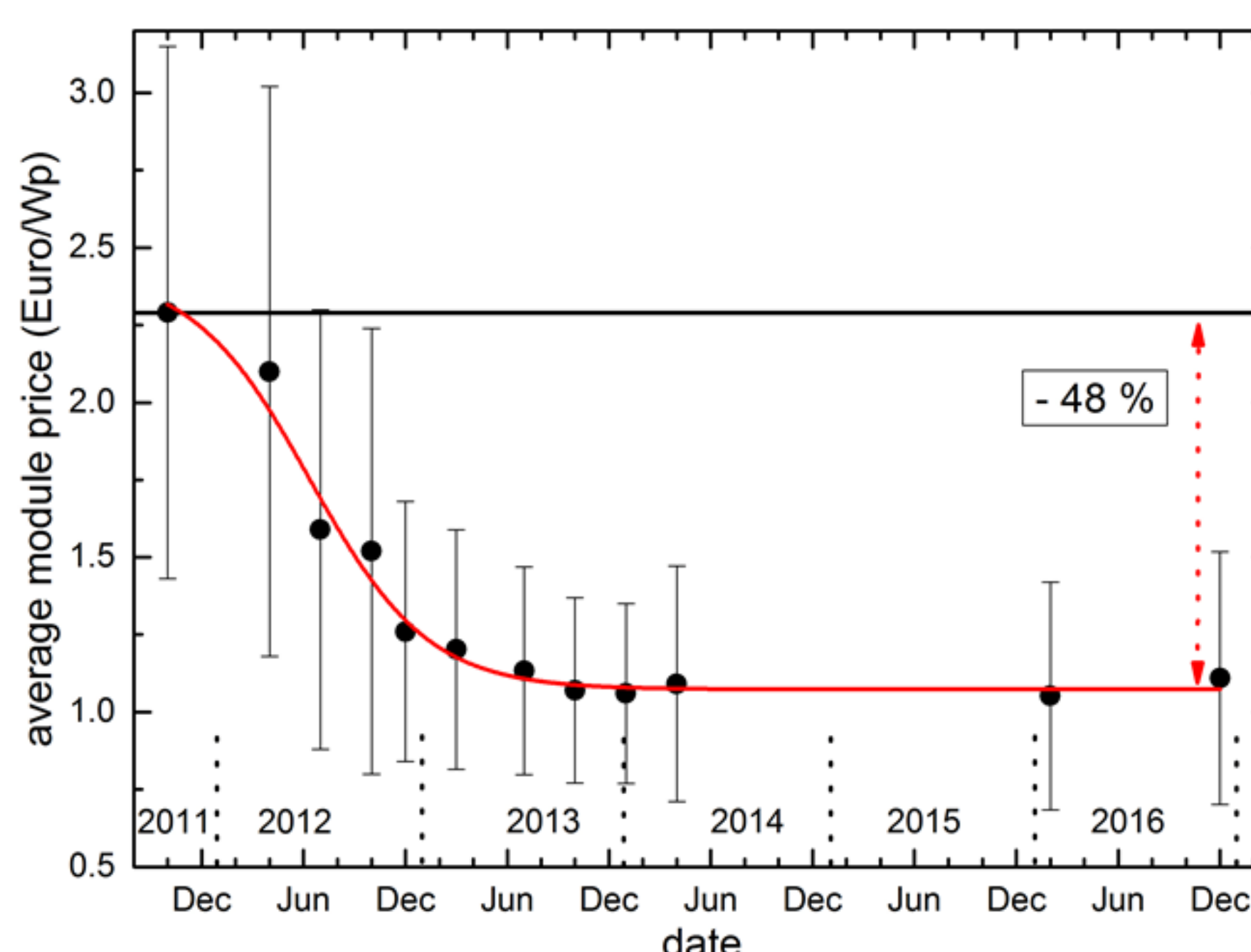
References

[1] W.G.J.H.M. van Sark, P. Muizebelt, J. Cace, A. de Vries, P. de Rijk, Price Development of Photovoltaic Modules, Inverters, and Systems in the Netherlands in 2012, Renewable Energy 71 (2014) 18-22.

[2] CBS Statline, <http://statline.cbs.nl/statweb/>, last access date 18 September 2017

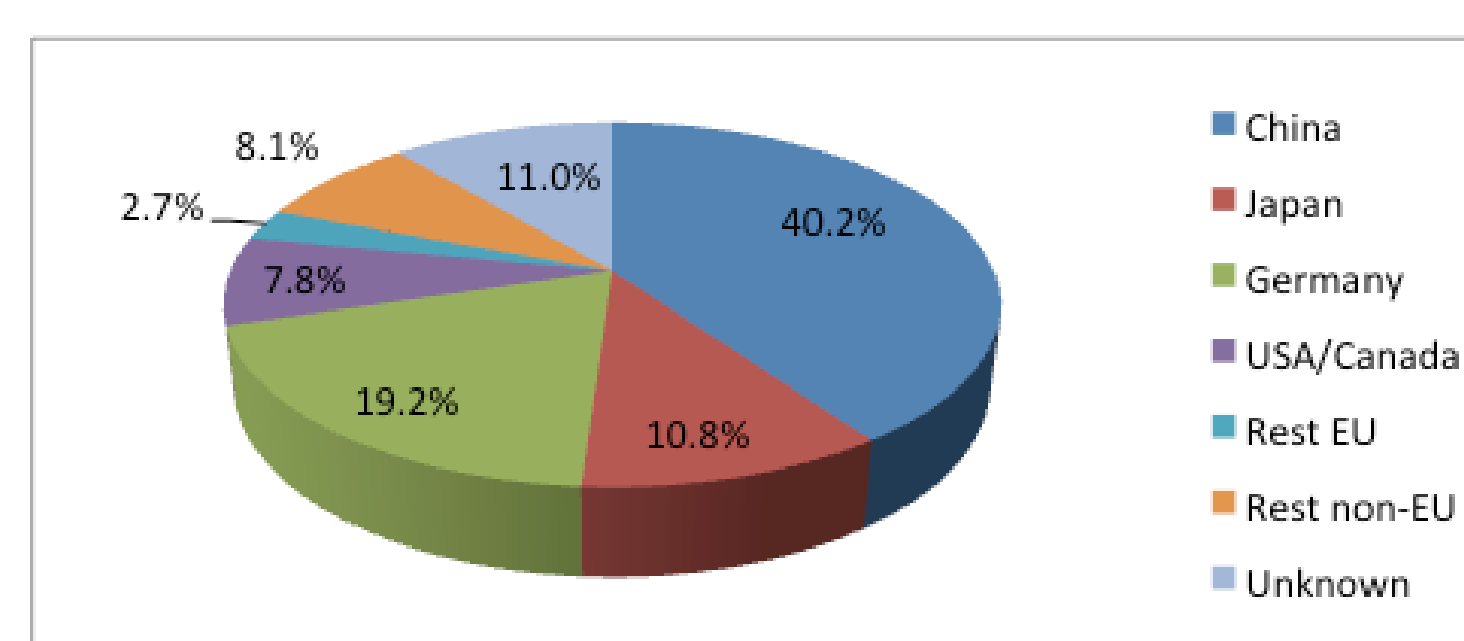
Modules

Price reduction of **48.4%** since October 2011, stable since 2014.



Dynamic market, expensive modules replaced by cheaper ones, and new brands/types ~25% each quarter.

Module country of origin

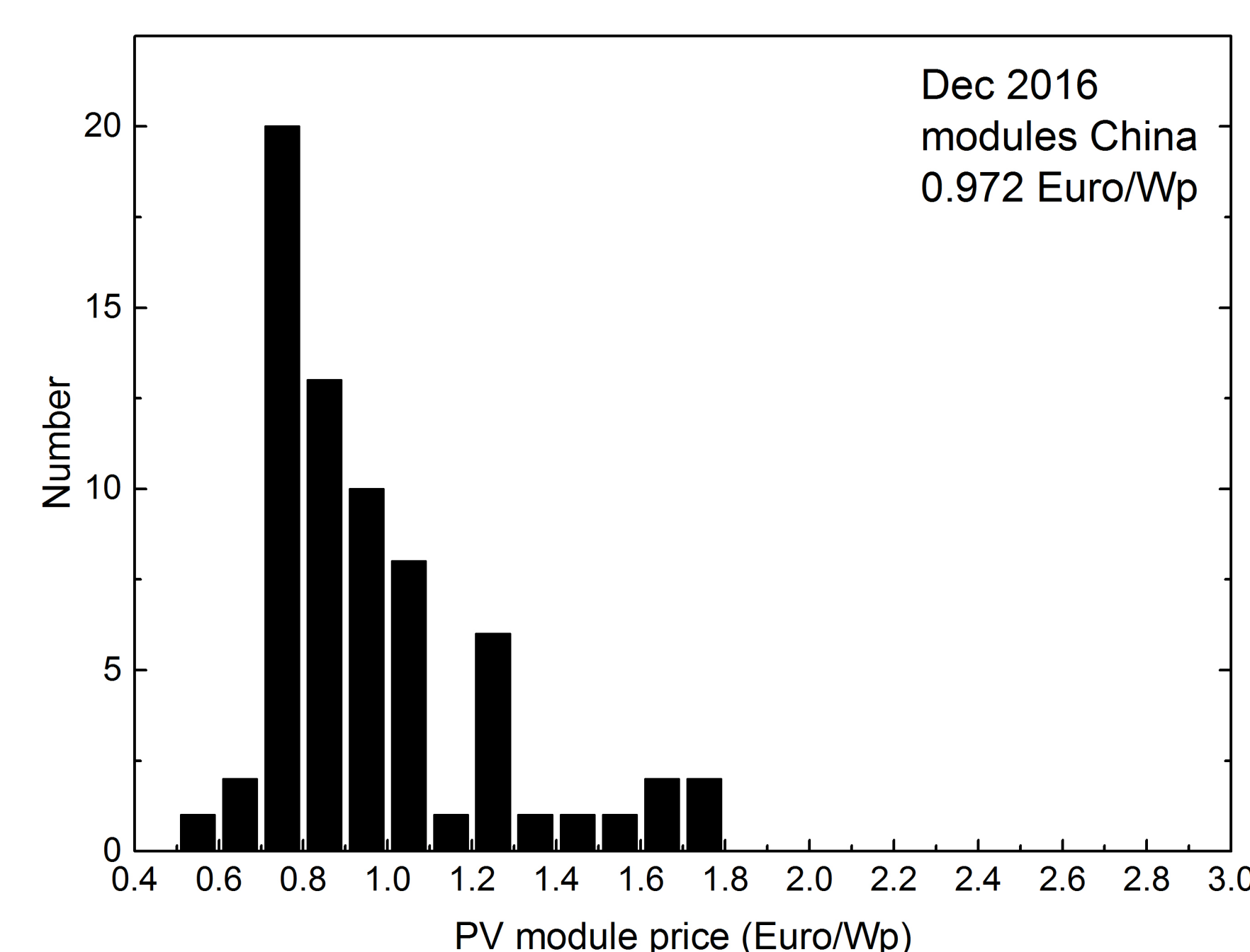
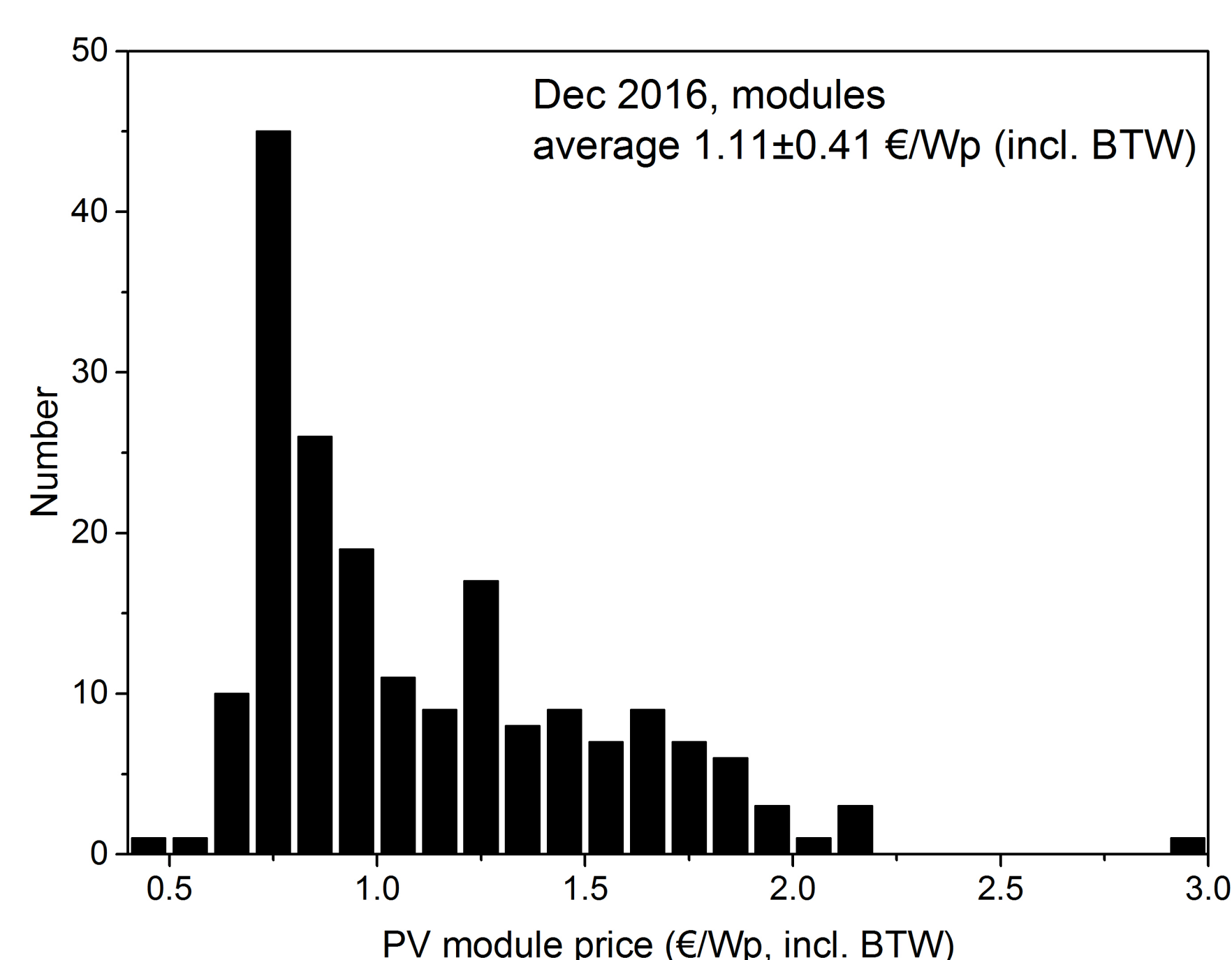


Average module price:

All: 1.11 €/Wp

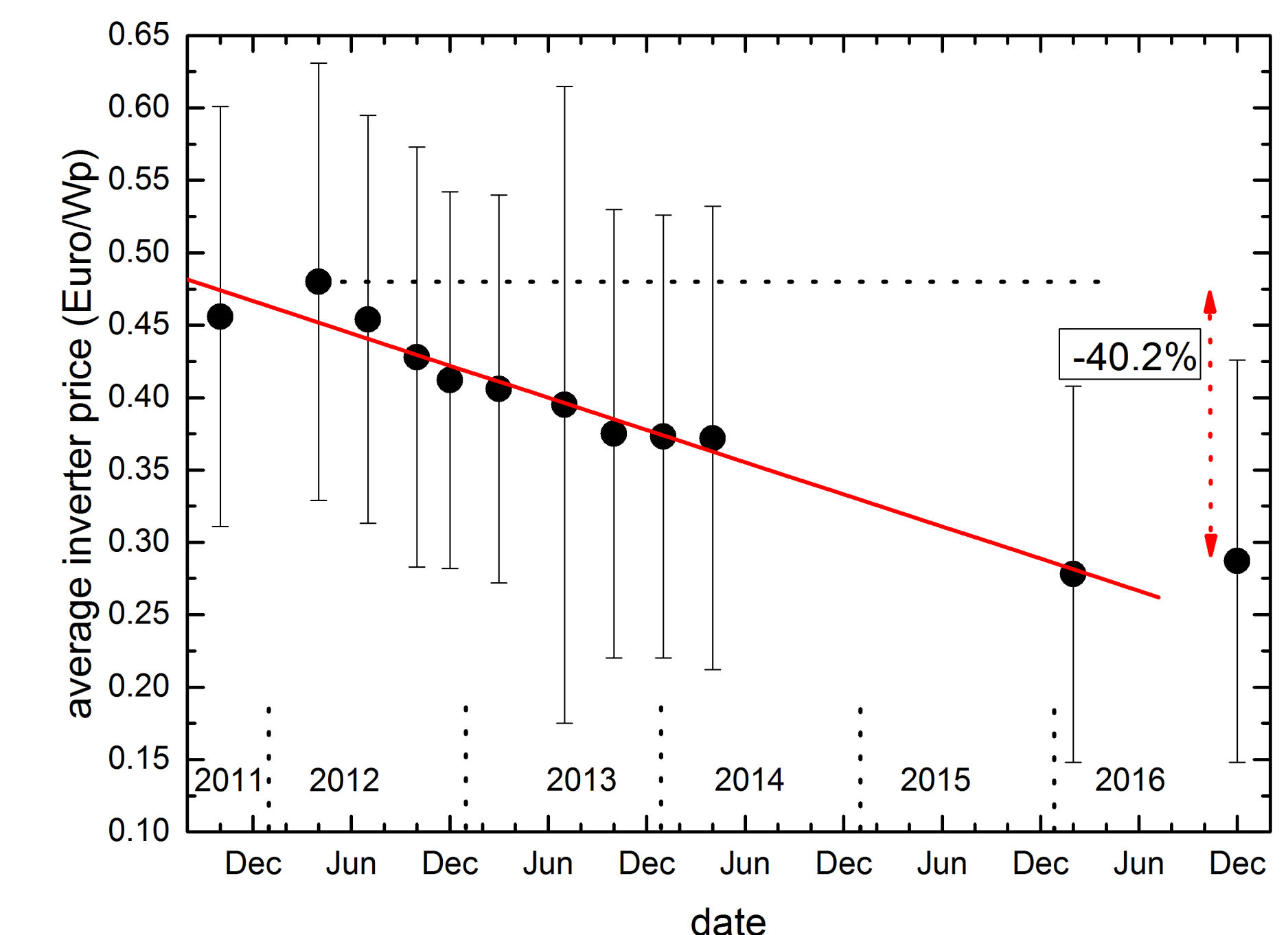
From China: 0.97 €/Wp

From other than China: 1.18 €/Wp



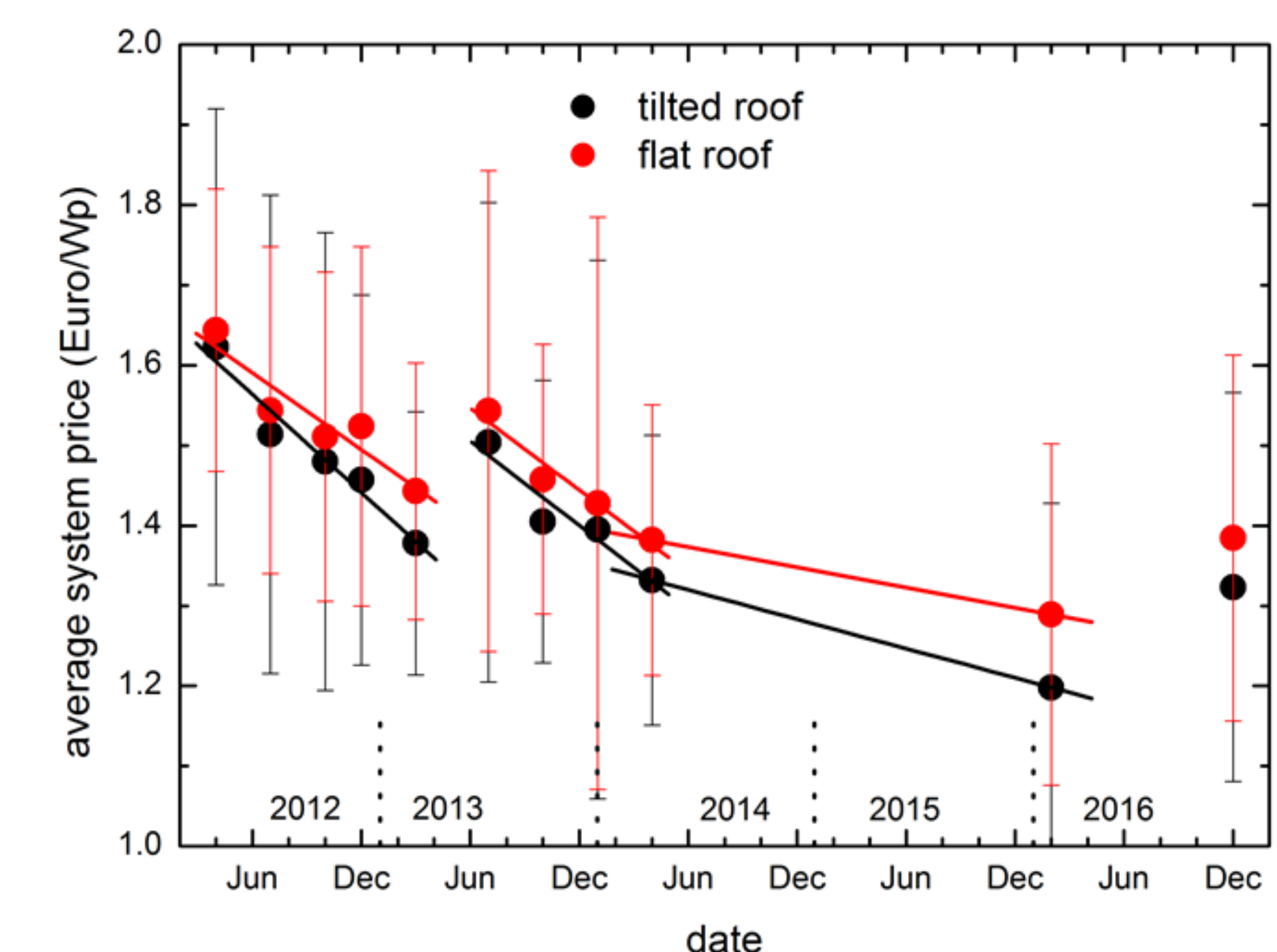
Inverters

Price reduction of **40.2%** since October 2011, steady decrease.

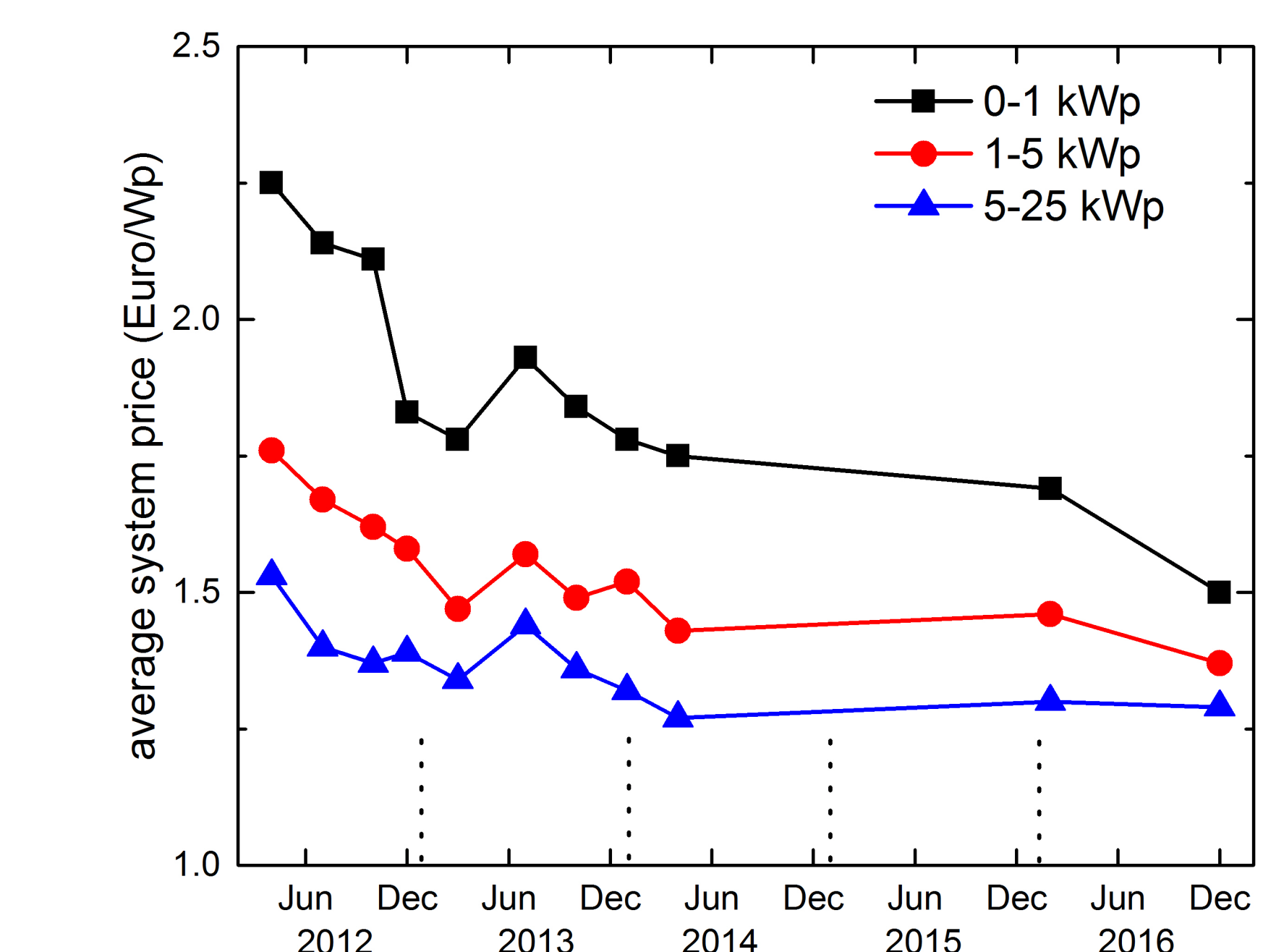


Systems (excluding installation)

Price reduction of **20%** since 2011, however increase in 2013 and 2016 observed.



System price is size dependent



Typical system prices, including installation. Levelized cost of electricity calculated with 900 kWh/kWp, 3% interest rate, 1% O&M, 25 year lifetime

System size kWp	Price €/Wp	Installation €/Wp	Total €/Wp	LCoE €/kWh
0.6	1.50	0.60	2.10	0.157
2.5	1.37	0.40	1.77	0.133
5	1.26	0.30	1.56	0.117
50	1.14	0.20	1.34	0.100

Conclusion

PV module price is stable, while inverter price decreases

System price increases, however grid parity is obvious