



Update of the Dutch PV specific yield for determination of PV contribution to renewable energy production: 25% more energy!

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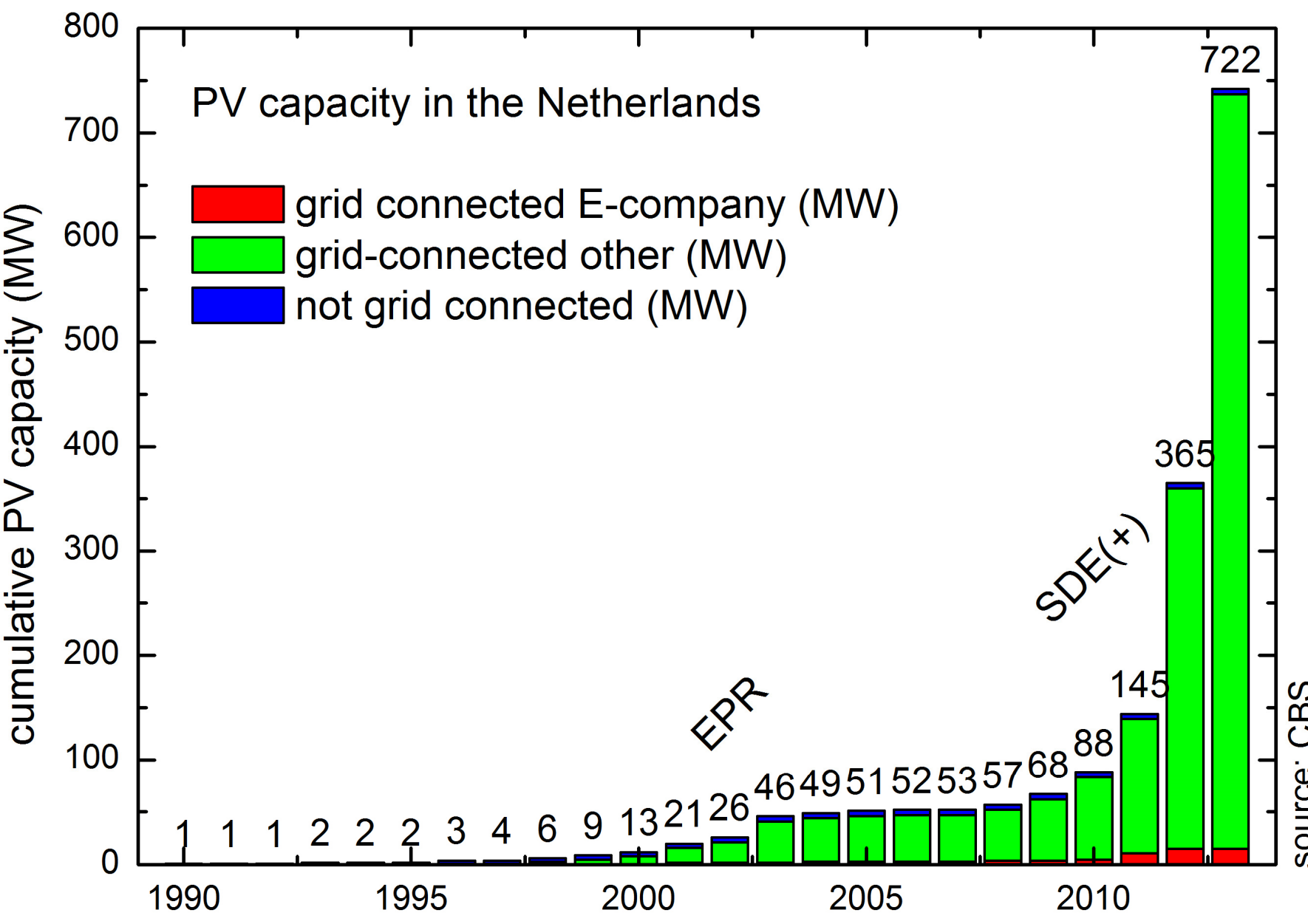
Introduction

Statistics Netherlands (CBS) annually publishes the amount of installed capacity of photovoltaic systems.

The amount of PV generated electricity is calculated from the installed capacity following a national protocol on monitoring of renewable energy [1]. In this protocol methods are described how to determine the amount of renewable energy for each technology, e.g. wind, biomass, solar thermal, solar PV, hydropower.

The amount of PV generated electricity is determined using a full-load-hours model: the capacity at the end of the year is multiplied with 700 h. This value has been determined based on historical data [2] and estimations on the specific annual yield of PV systems: 700 kWh/kWp.

Renewal of protocol is necessary: PV systems in the Netherlands now are producing much than 700 kWh/kWp according to market stakeholders.



Method

Collect PV performance data from Dutch PV systems

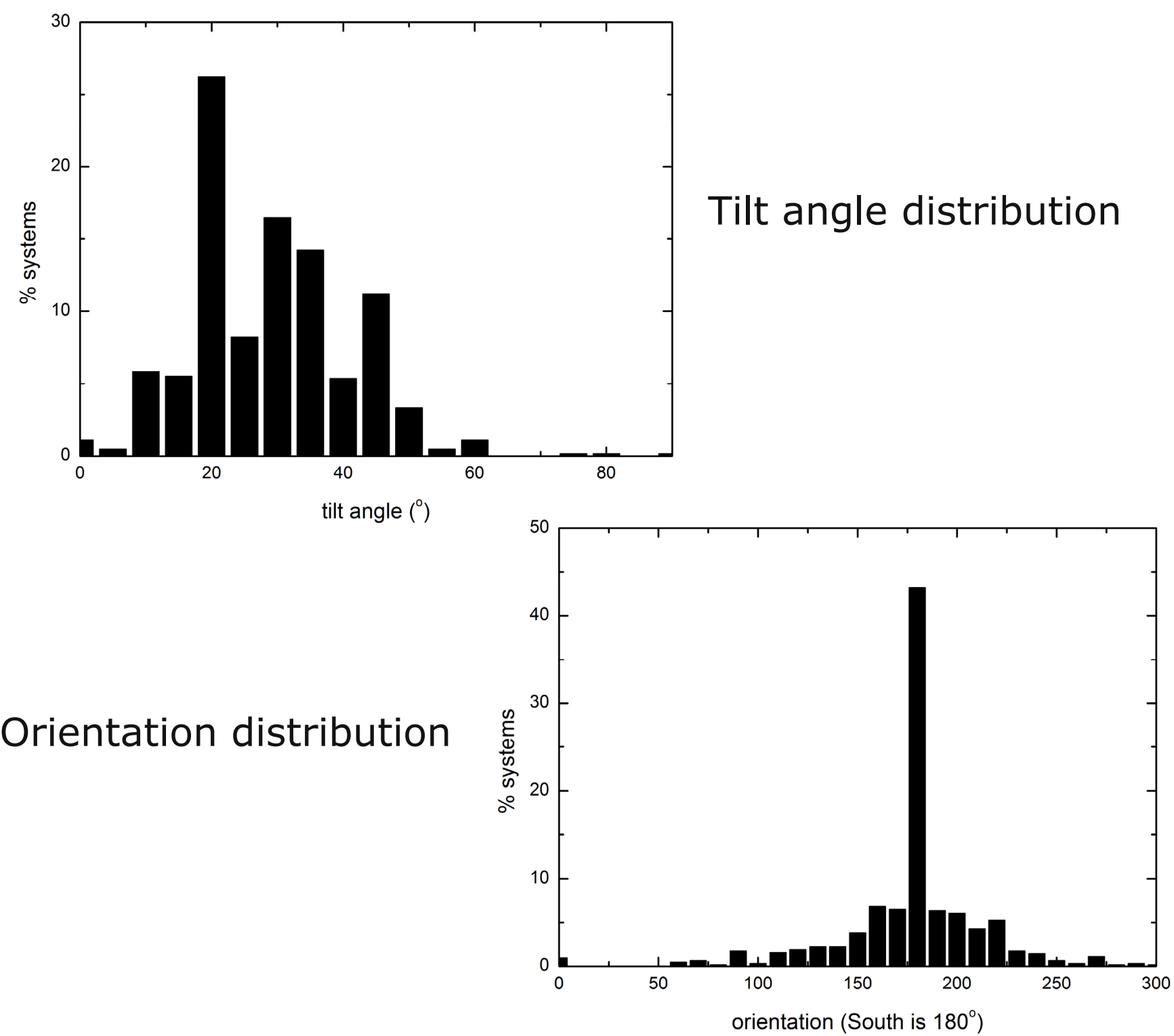
Only systems with full year data

- Open data sources
 - A. Solarlog
 - B. zonnestroomopbrengst.eu
- SolarCare (C)
- CertiQ (difficult to extract production)

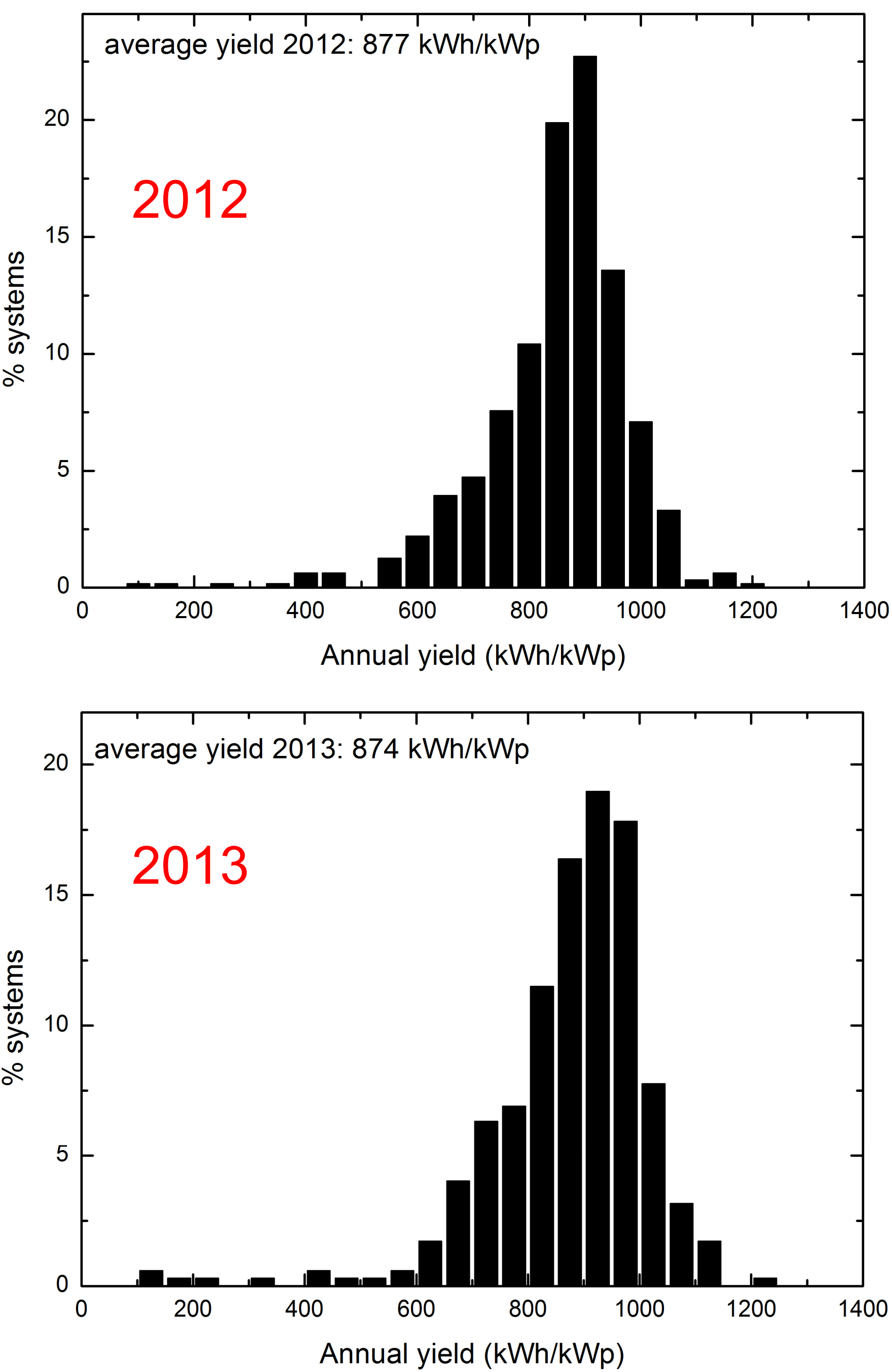
Organization of expert workshop to discuss results

Decide on advice for new annual specific yield

Data source	2012 (# systems)	2013 (systems)	accuracy	totals
A	322	728	unknown	day
B	222	-	unknown	month
C	90	809	2%	day
Total	2.4 MWp	11.6 MWp		



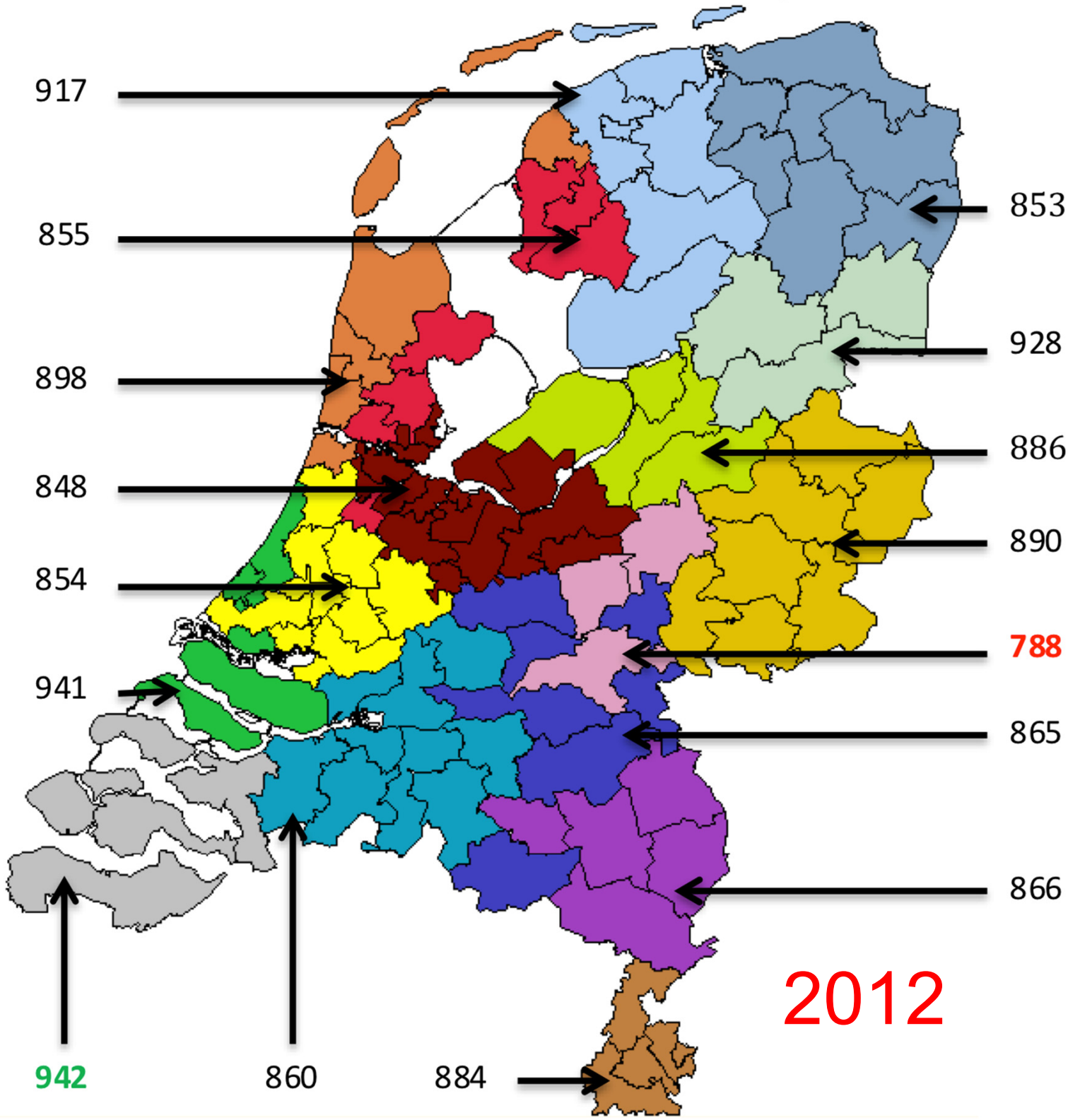
Results



year	yield (kWh/kWp)	stdev (kWh/kWp)
2012	877	137
2013	874	145

Annual irradiation:
2012: 1036.2 kWh/m²
2013: 1044.9 kWh/m²

Varies over the country → variation of yield



New specific yield

700 kWh/kWp

+25%

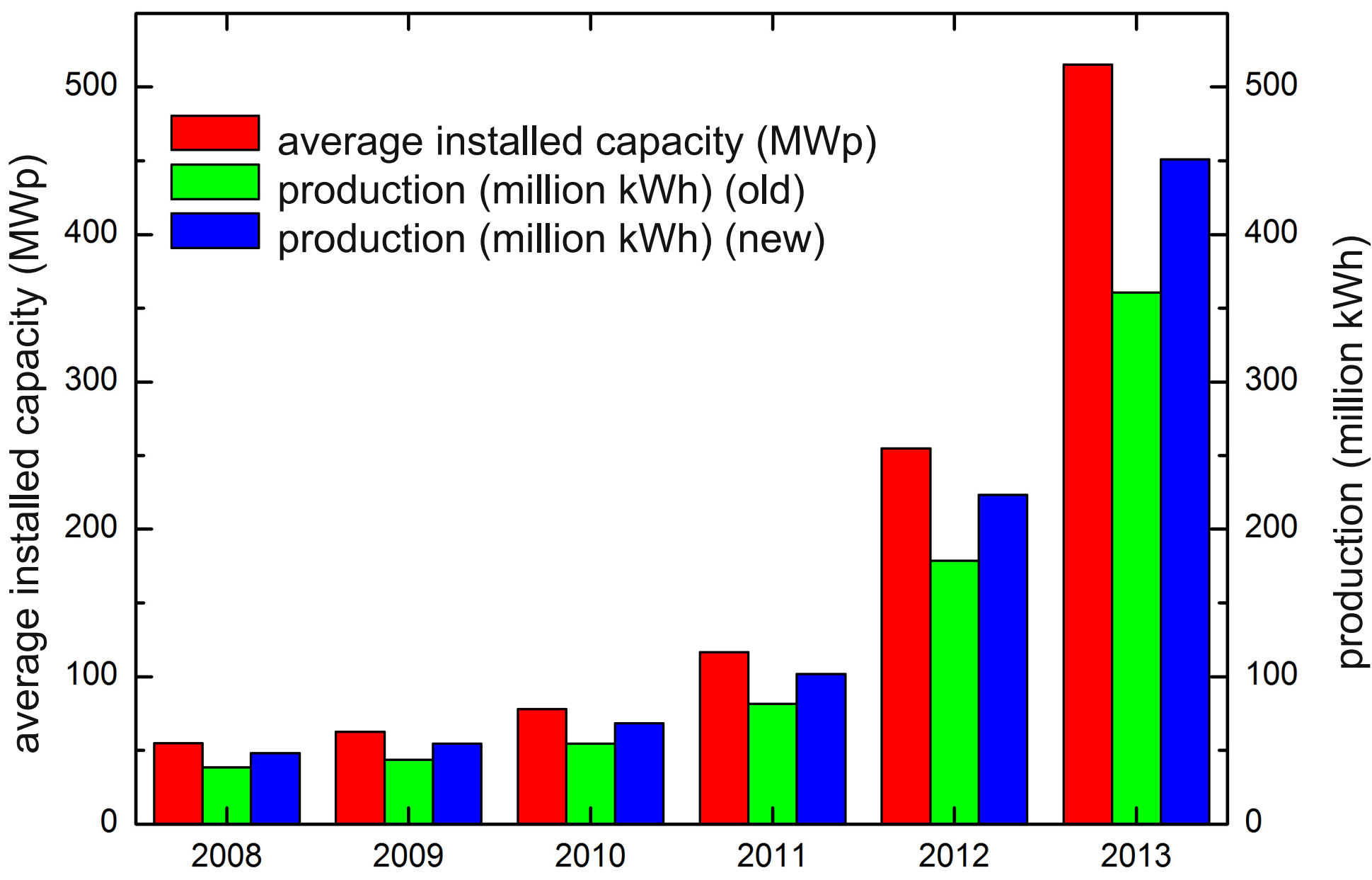
875 kWh/kWp

Will be used in protocol, starting back from 2011.

Annual PV production

Procedure:

- determine average installed PV capacity per year
- multiply with specific yield
 - old: 700 kWh/kWp
 - new: 875 kWh/kWp



PV production in 2013 is 0.5% of total electricity demand in The Netherlands.

Conclusion

- New specific yield is derived from actual PV production data
- Updated value is 875 kWh/kWp and will be used in future CBS reports
- Data from 2011 onwards will be adjusted
- Results are supported by stakeholders in Dutch PV market

References

[1] Protocol Monitoring Renewable Energy, AgentschapNL, 2010.

[2] A.C. de Keizer, E. Ter Horst, E.C. Molenbroek, W.G.J.H.M. van Sark, Evaluating 5-years performance monitoring of 1 MW building integrated PV project in Nieuwland, Amersfoort, the Netherlands. Proceedings of the 22nd European Photovoltaic Solar Energy Conference, 2007, pp. 2960-2965.

References

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