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## Trends in Market Segments

### Towards More Solar Parks or Individual Installations?

EPIA

2<sup>nd</sup> International Conference on Solar Photovoltaic Investments

EuPD Research

Frankfurt, February 19<sup>th</sup>, 2008

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# Agenda

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## **A. Concept of Market Segmentation**

1. The Need for Market Segmentation
2. Requirements of Market Segments
3. One-Dimensional Market Segmentation for PV
4. Multi Dimensional Segmentation for PV
5. PV Market Segments in Europe

## **B. Market Segmentation Data**

1. Customer Segmentation in 2007
2. IPP vs. Individual Installations in 2007 (Cum. Market Volume and Annual Investments)
3. IPP vs. Individual Installations in 2010 (Cum. Market Volume and Annual Investments)
4. Conclusion

## **C. Implications for IPP Investment Decision Making**

1. IPP Factors of Success in Country Markets
2. Investment Allocation via Portfolio Theory

## **D. Summary**

## **Editorial**

## A.1. The Need for Market Segmentation

### The Reason Why

- Helps to identify different market portions
- Allows companies to satisfy potential customer needs

#### No segmentation

Mass marketing refers to a treatment of the market as a homogenous group and offering the same marketing mix to all customers.

**VS.**

#### Segmentation

Target marketing recognizes the diversity of customers and does not try to please all of them with the same offering.

### Results of Market Segmentation

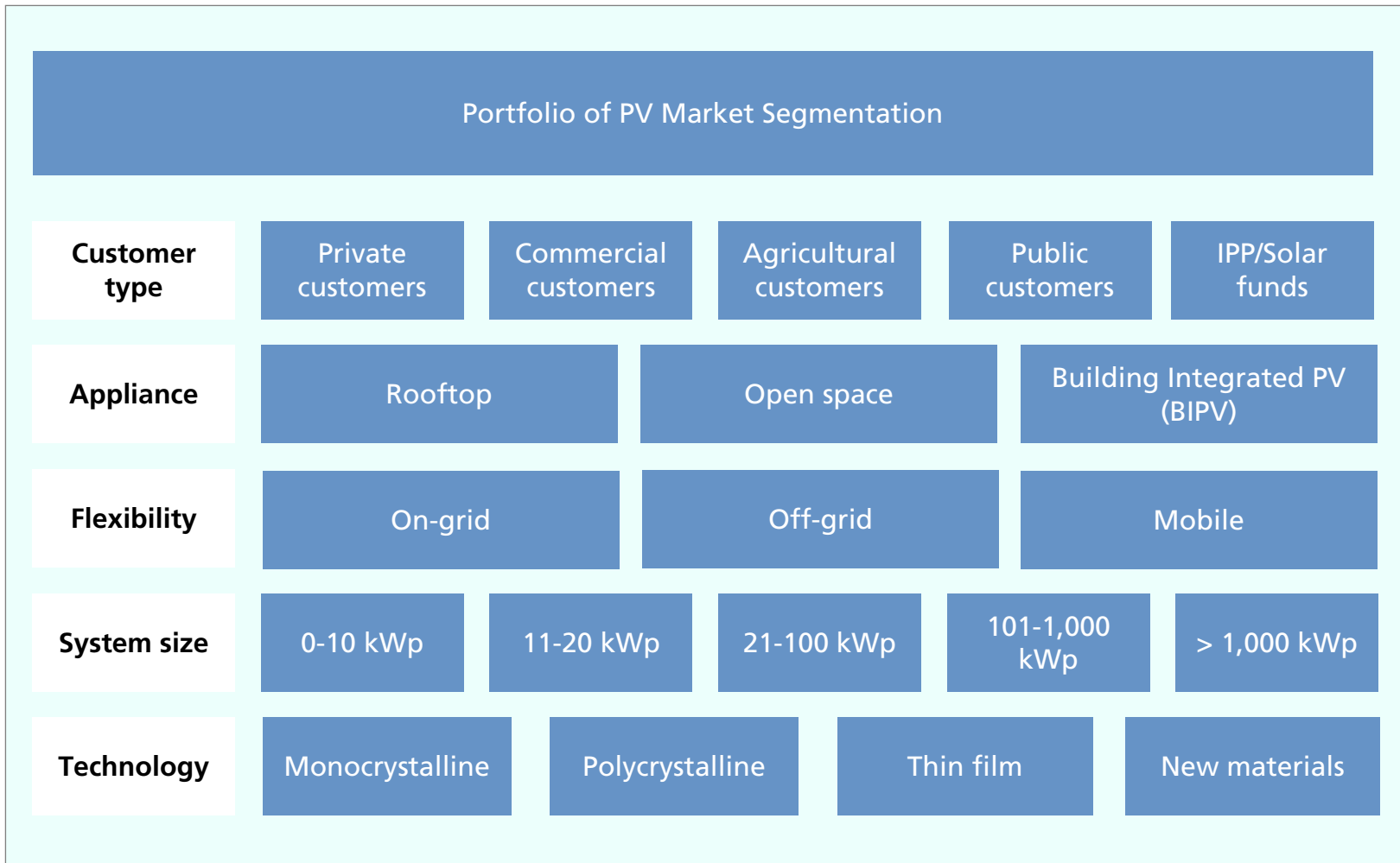
- Internally homogenous and externally heterogeneous segment members
- Being as similar as possible within the segment, and as different as possible between the segments

## A.2. Requirements of Market Segments

For a segmentation to be practical, the respective groups should be evaluated against the following criteria:

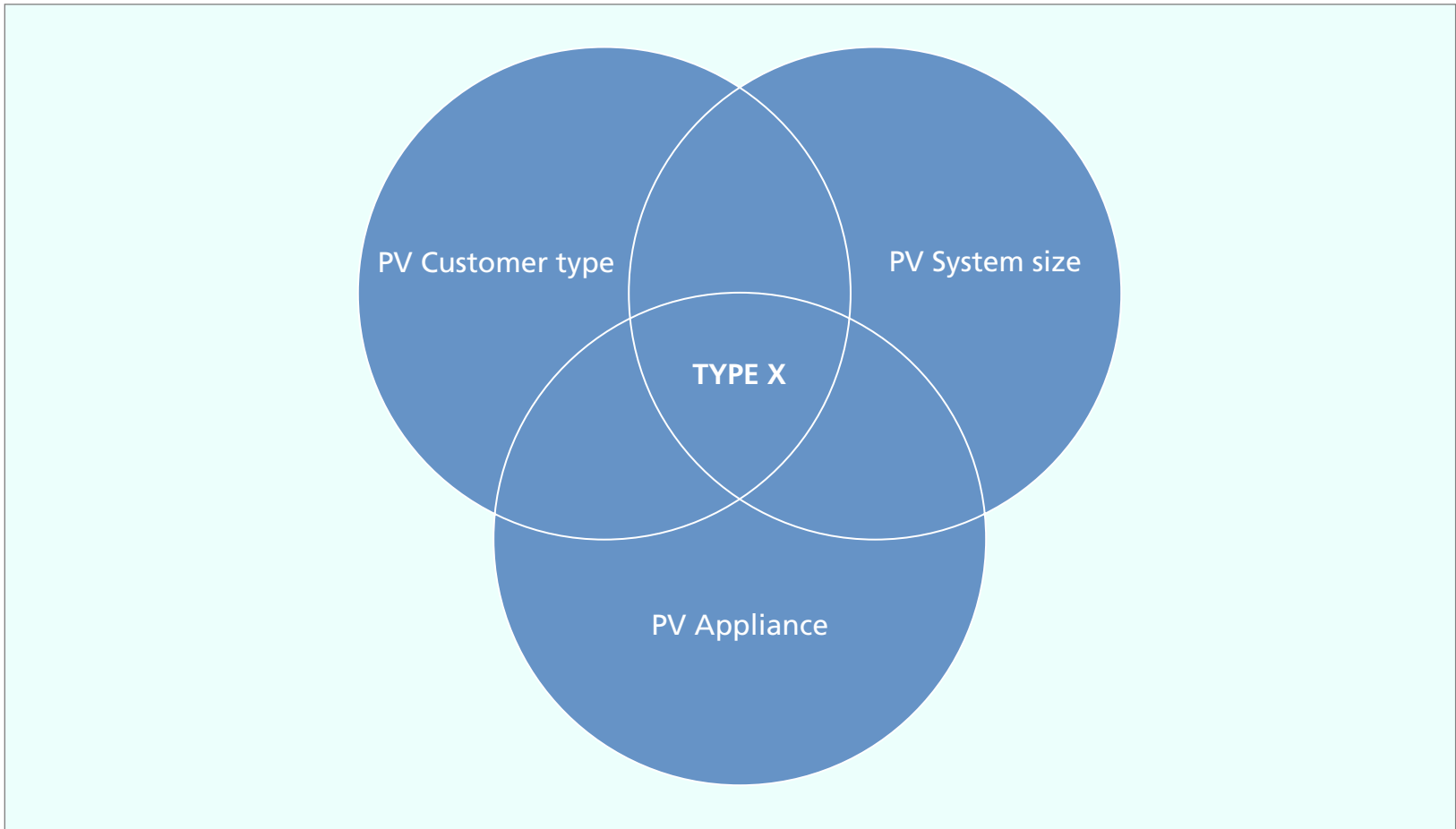
<b>Identifiable</b>	<ul style="list-style-type: none"><li>▪ The differentiating attributes of the segments must be measurable so that they can be identified.</li></ul>
<b>Accessible</b>	<ul style="list-style-type: none"><li>▪ The segments must be reachable through communication and distribution channels.</li></ul>
<b>Substantial</b>	<ul style="list-style-type: none"><li>▪ The segments should be sufficiently large to justify the resources required to target them.</li></ul>
<b>Unique</b>	<ul style="list-style-type: none"><li>▪ To justify separate offerings, the segments must respond differently to the different marketing mixes.</li></ul>
<b>Durable</b>	<ul style="list-style-type: none"><li>▪ The segments should be relatively stable to minimize the cost of frequent changes.</li></ul>

## A.3. One-Dimensional Market Segmentation for PV




## A.4. Multidimensional Segmentation for PV

If marketing activities are to be oriented towards certain market segments, it is advisable to combine the identified one-dimensional segmentation criteria.



## A.5. PV Market Segments in Europe

<p>Type A Private Customer</p>	<ul style="list-style-type: none"> <li>Private person investing on his own behalf in solar power by installing a PV plant on his own residential building</li> <li>Typical system size: &lt; 10 kWp</li> <li>Rooftop, BIPV</li> </ul>	
<p>Type B Industrial Customer</p>	<ul style="list-style-type: none"> <li>Commercial body or company installing a PV plant on own buildings such as warehouses, supermarkets, factories etc.</li> <li>Typical system size: 10 - 100 kWp</li> <li>Rooftop, BIPV</li> </ul>	
<p>Type C Agricultural Customer</p>	<ul style="list-style-type: none"> <li>Person – in particular a farmer – investing in PV installations on barns or stables or land areas not agriculturally used</li> <li>Typical system size: 10 - 100 kWp</li> <li>Rooftop, BIPV, open space</li> </ul>	
<p>Type D Public Customer</p>	<ul style="list-style-type: none"> <li>Public entity that invests in PV installations on public buildings such as town halls, schools, hospitals or theaters etc.</li> <li>Typical system size: 1 kWp - 100 kWp</li> <li>Rooftop, BIPV</li> </ul>	
<p>Type E IPP/Solar Funds</p>	<ul style="list-style-type: none"> <li>Professional investors such as investment banks bundling capital of contributors to invest in large-scale PV systems</li> <li>Typical system size: &gt; 500 kWp</li> <li>Open space, rooftop</li> </ul>	

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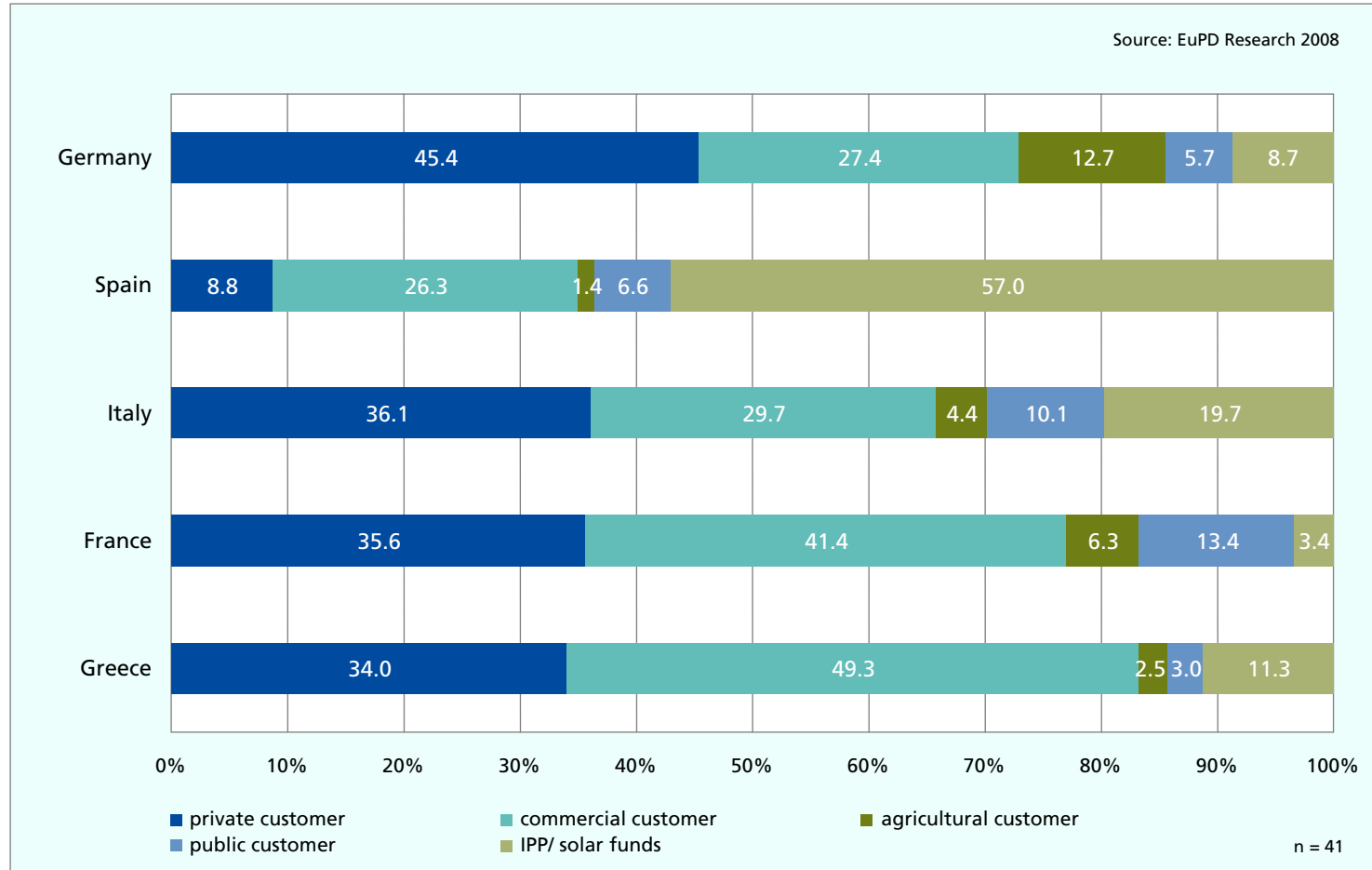
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## B.1. Customer Segmentation in 2007 (%)

What are the current shares of each customer segment in European markets?

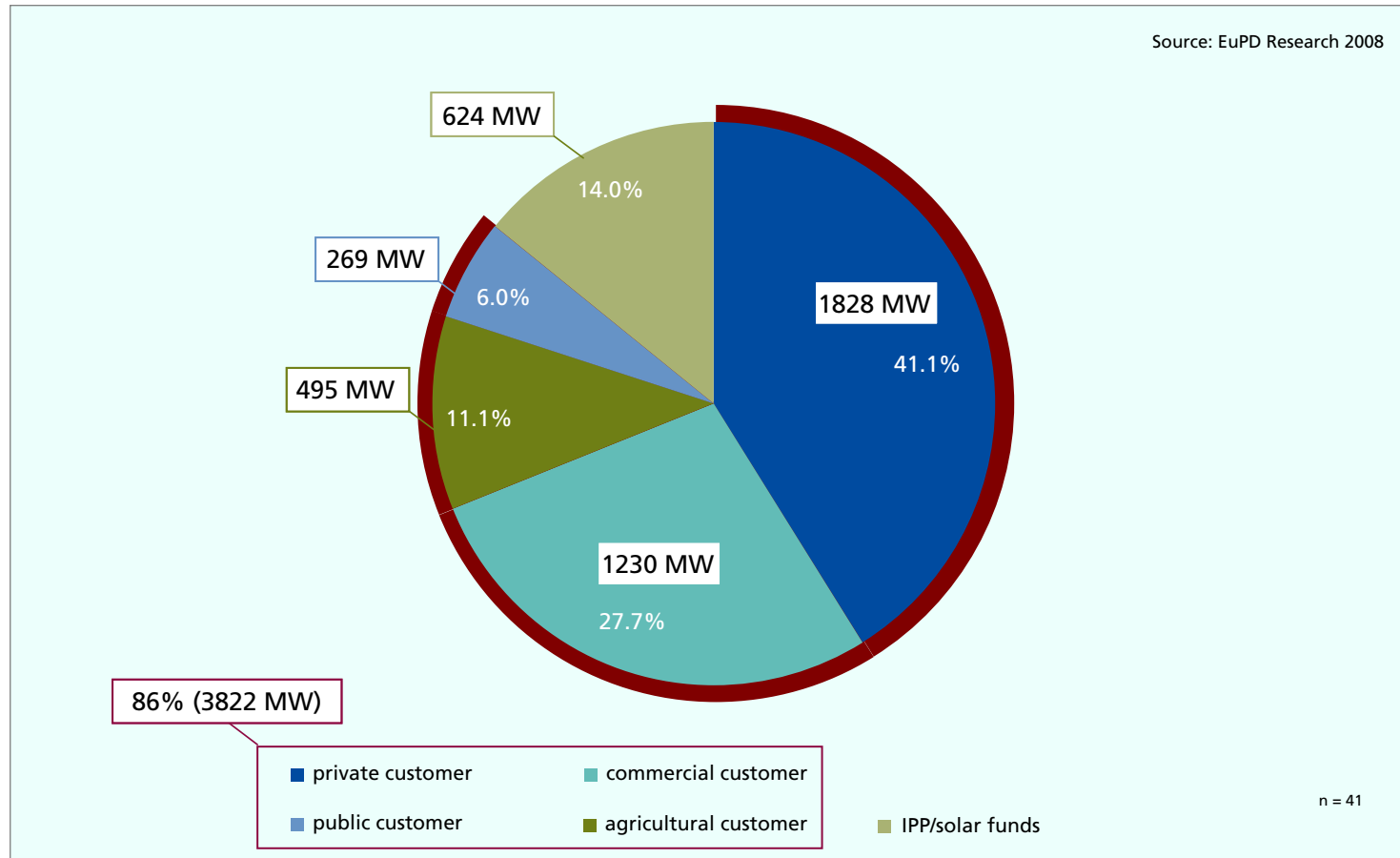


According to the results of the European Business Climate Index (quarterly inquiry among experts and market participants) the share of customer segments varies across Europe.

Possible explanations are: Historical development, diffusion stage of segments, architectural features, feed-in characteristics, objective targets of market players and last but not least the different absolute size of markets.

## B.1. Customer Segmentation in 2007 (MWp)

In MWp, the following allocation of segments is valid for total Europe:

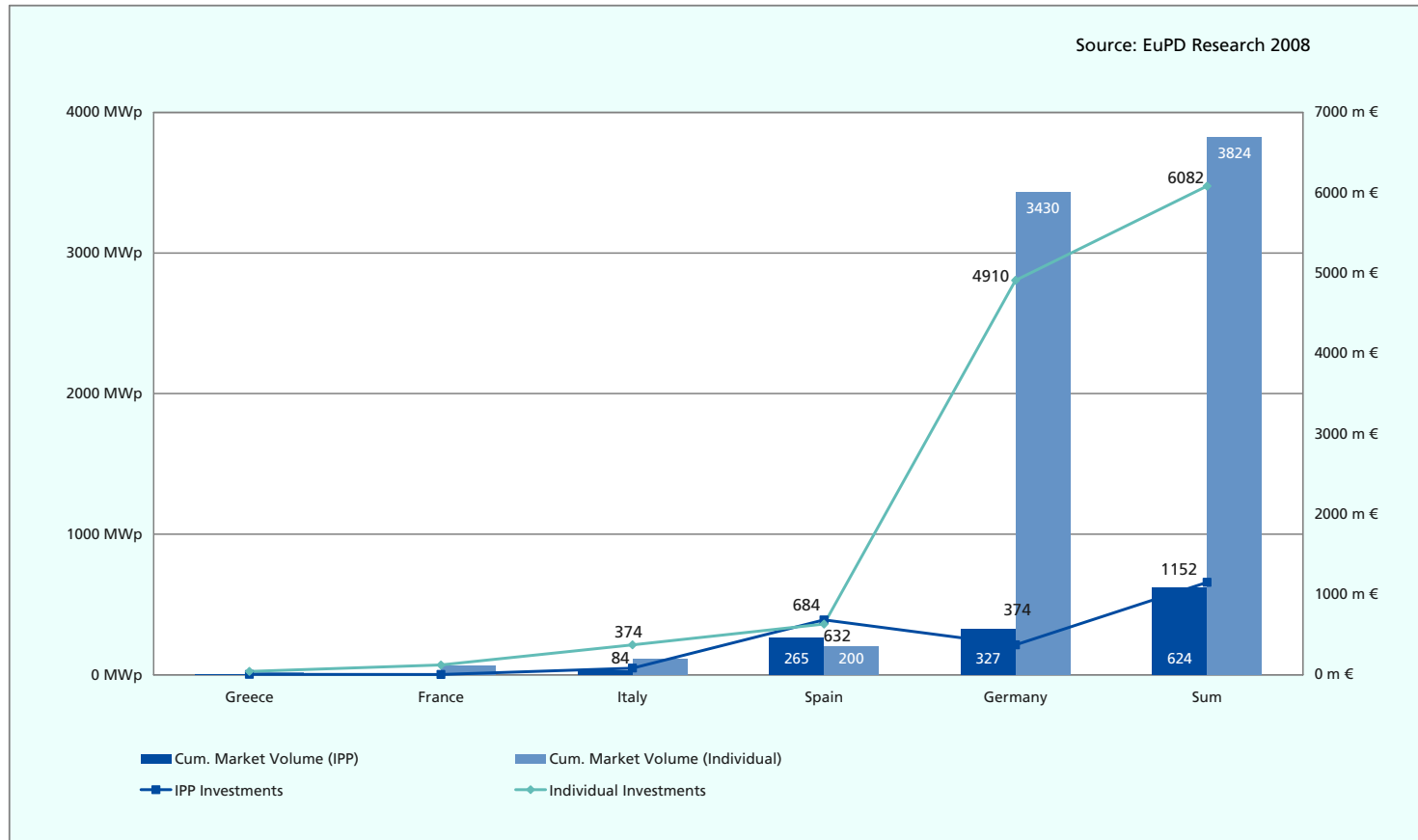


14 percent of the total installed capacity in Europe or roughly 600 MW are installed in solar funds.

The relation between IPP and individual installations in Europe is dominated by the situation in Germany.

## B.2. IPP vs. Individual Installations in 2007 (Cum. Market Volume and Annual Investments)

For 2007, the allocation between segments and corresponding annual investments ... will approximately amount to...?



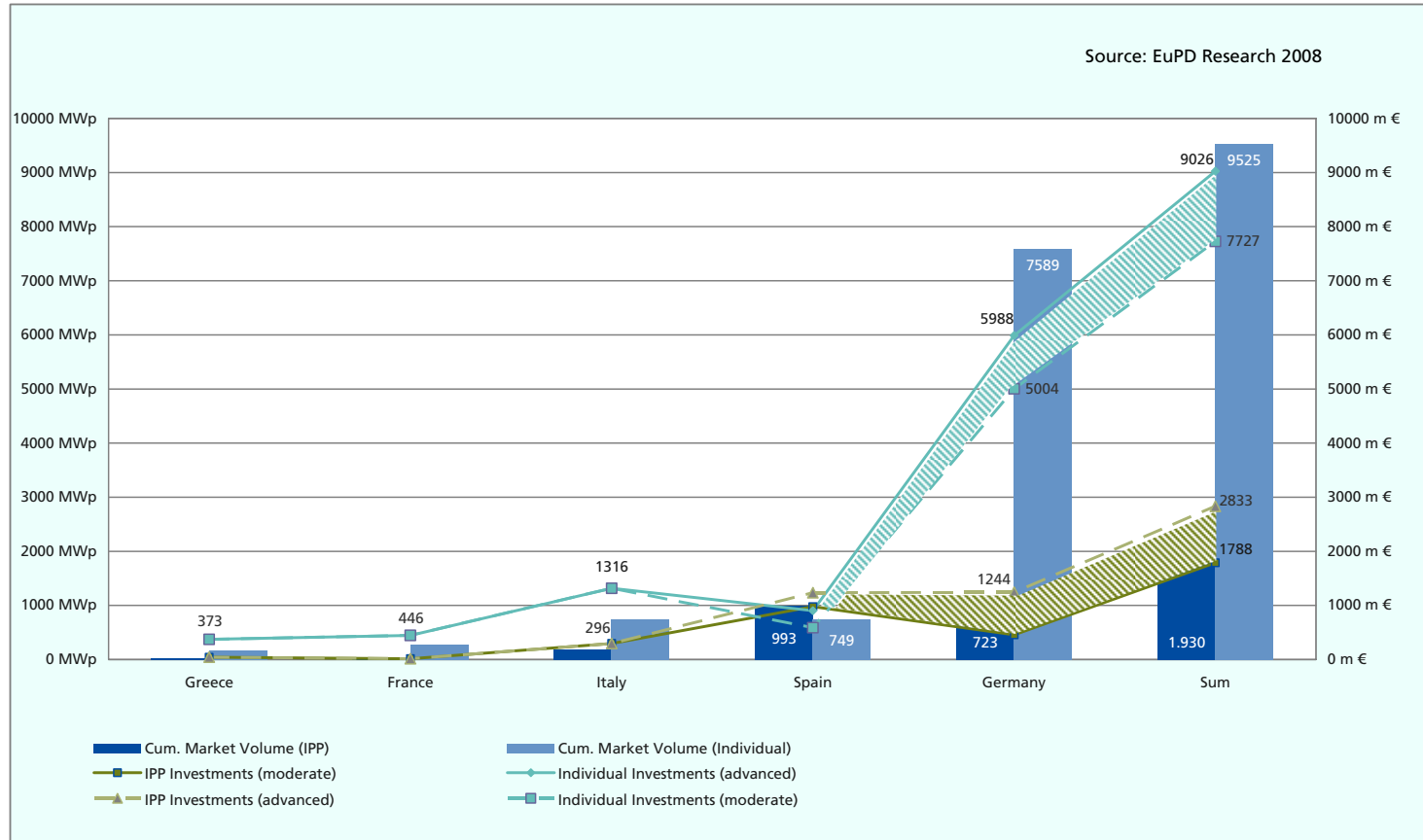
As the focus of this presentation is only the relation between IPP and individual installations the previous shown segmentation reduces to a minimum.

Nevertheless, the clear domination of the individual installation sector remains strong.

The same is true for annual investments: Roughly 15 percent of the annual investments, which corresponds to 1.152 billion Euro, were spent for IPP installation.

## B.3. IPP vs. Individual Installations in 2010 (Cum. Market Volume and Annual Investments)

For 2010, the allocation between segments and corresponding annual investments ... will approximately amount to...?



Assumed that the relation between IPP and individual installation remains constant until 2010, the annual investment volume for IPP would increase to roughly 1.8 billion Euro, while individual installations reach nine billion Euro.

In case of IPP doubling overall shares (30%), roughly 2.8 billion Euro IPP investment volume per year is possible.

## B.4. Conclusion

### Market segmentation opens up investment opportunities

- ⇒ Share of customer segments non-uniform in Europe: German market mostly driven by individual installation while Spain as the second biggest market has a focus on IPP
- ⇒ Share of IPP in total in Europe is only 15 percent which corresponds to an annual investment volume of roughly 1.2 billion Euro.
- ⇒ Assuming that customer segmentation will not change in the mid-term, annual investments of roughly 1.8 billion Euro are expected in 2010. In case that IPP-share in total might double in Europe, 2.8 billion Euro annual investments are possible.
- ⇒ Further questions: Which factors are most influential for further IPP growth? What are country-specific factors? How is the optimum portfolio to be constructed concerning the risk-return profile?

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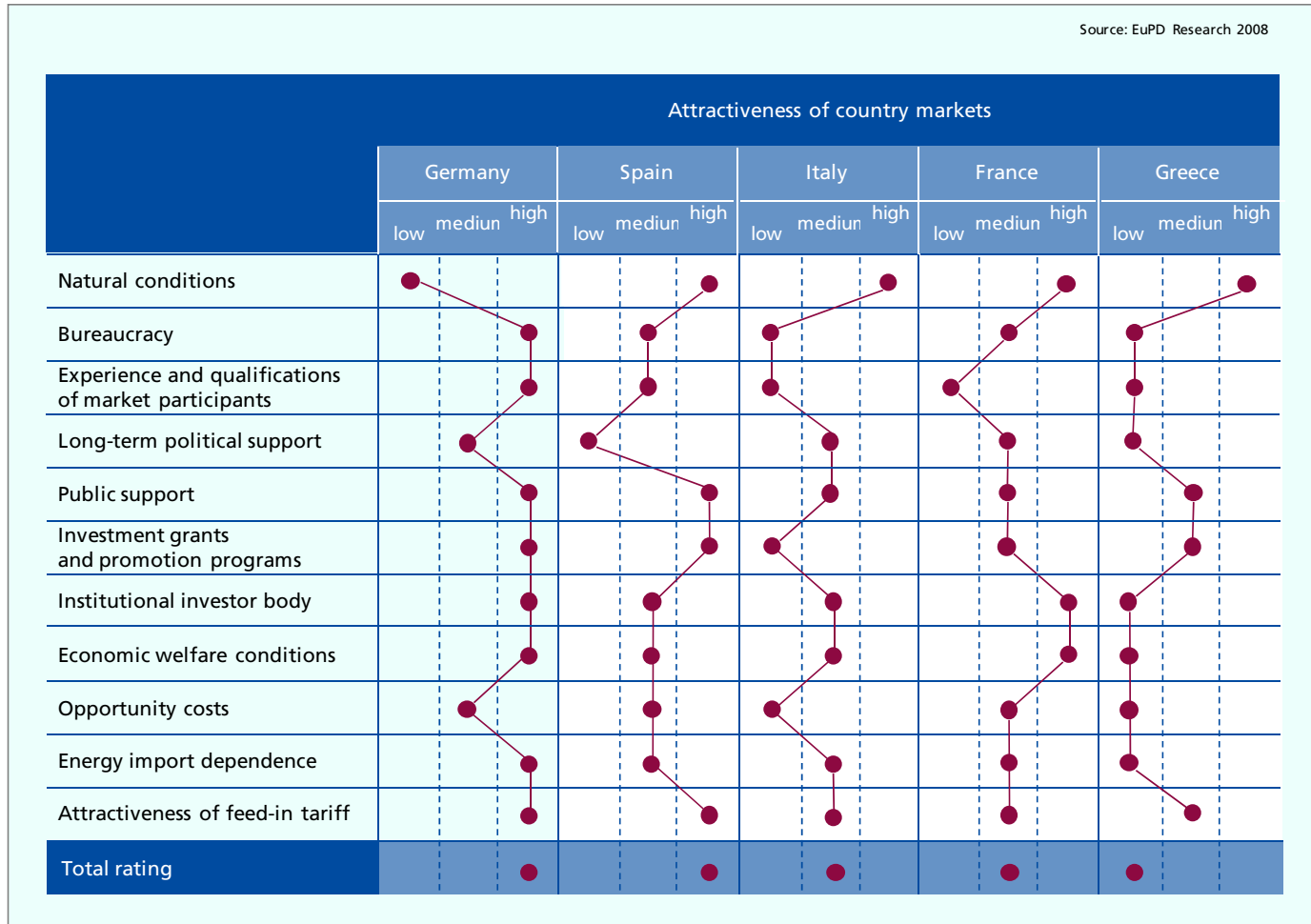
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## c.1. IPP Factors of Success in Country Markets

What determines the attractiveness of country markets?

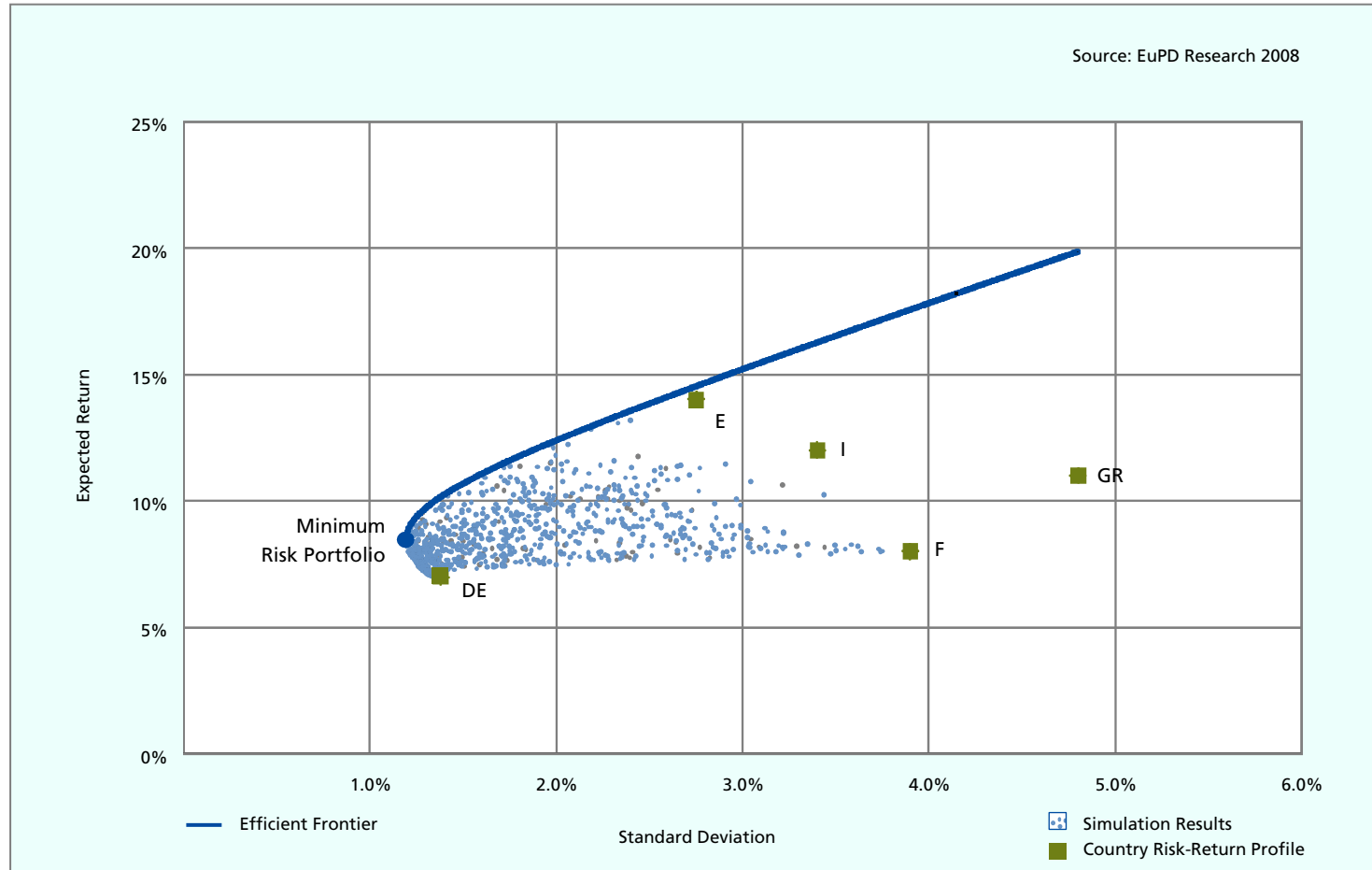


The evaluation of investment opportunities in different countries requires not only the consideration of obvious factors like solar radiation and feed-in tariff, but also an analysis of the degree of bureaucracy, the experience and qualifications of market participants, the possibility of investment grants and opportunity costs.

As far as market segments are concerned, it is to be kept in mind that IPP is highly cost-driven.

## c.2. Investment Allocation via Portfolio Theory I

### Efficient frontier concerning five assets (country markets)



IPP investments across Europe follow a different risk-return profile. Therefore and on account of small correlation coefficients the efficient portfolio of investments can be found using portfolio theory.

1,000 simulations of investment combinations lead to the efficient frontier (blue line) as the geometrical location of all efficient portfolios.

Question: Which portfolio to choose?



## c.2. Investment Allocation via Portfolio Theory II

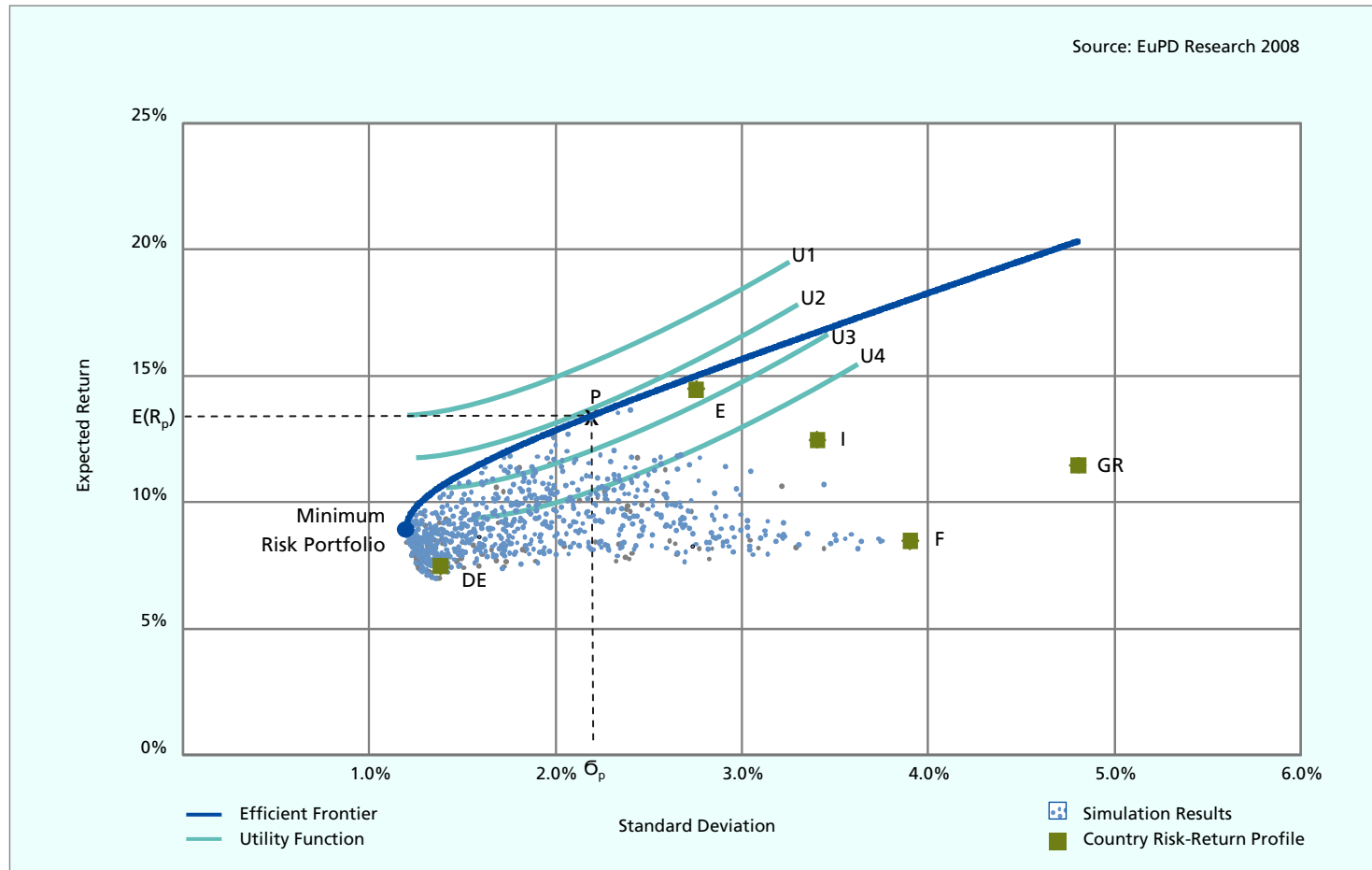
### Efficient frontier concerning five assets (country markets)



Answer: It depends on your utility function and the question if you are risk averse, risk loving or risk neutral.

## c.2. Investment Allocation via Portfolio Theory III

### Efficient frontier concerning five assets (country markets)



The osculation point between your utility function and the efficient frontier will lead you to the portfolio to choose, which is P.

This example clearly demonstrates the risk and return improving function of diversification.

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### Market Segmentation allows for transparency

- ⇒ Market segmentation is on the one hand a necessity to address and satisfy potential customer needs, on the other hand it is the opportunity to quantify investment volumes.
- ⇒ In contrast to capital markets where diversification across countries is not as promising as in the past, the diversification of investments into the photovoltaic market across Europe can lead to better risk-return profiles than investing only in one country.
- ⇒ As far as future perspectives are concerned, the differentiation between only two segments is not all-embracing. Especially the potential of industrial customers is promising (roof-exchange). Incorporation of off-grid systems will lead to further heterogeneity.

## Editorial

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