

Non-availability of exchange PV modules – replacement strategies and legal background

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Agenda

- BayWa r.e. and BayWa r.e. Operation Services
- Replacement Strategies – Common practice
- Advice of the German clearing house (“Clearingstelle EEG”)



BayWa r.e. and BayWa r.e. Operation Services

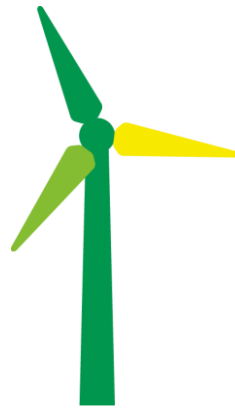


SOLAR ENERGY

WIND ENERGY

BIOENERGY

GEOTHERMAL ENERGY



BayWa r.e. and BayWa r.e. Operation Services



PROJECT
DEVELOPMENT &
IMPLEMENTATION

TRADING

SERVICES

TECHNICAL
CONSULTING &
ENGINEERING



BayWa r.e.
Operations Services GmbH

BayWa r.e. and BayWa r.e. Operation Services

Organisation

- 32 employees in Munich (head office) and other branch offices in Germany
- 17 employees (technicians) in European countries
- O&M mandates in Germany, Czech Republic, Greece, Poland, Italy, France, Spain and UK, first solar O&M activities in US and Japan

O&M Wind

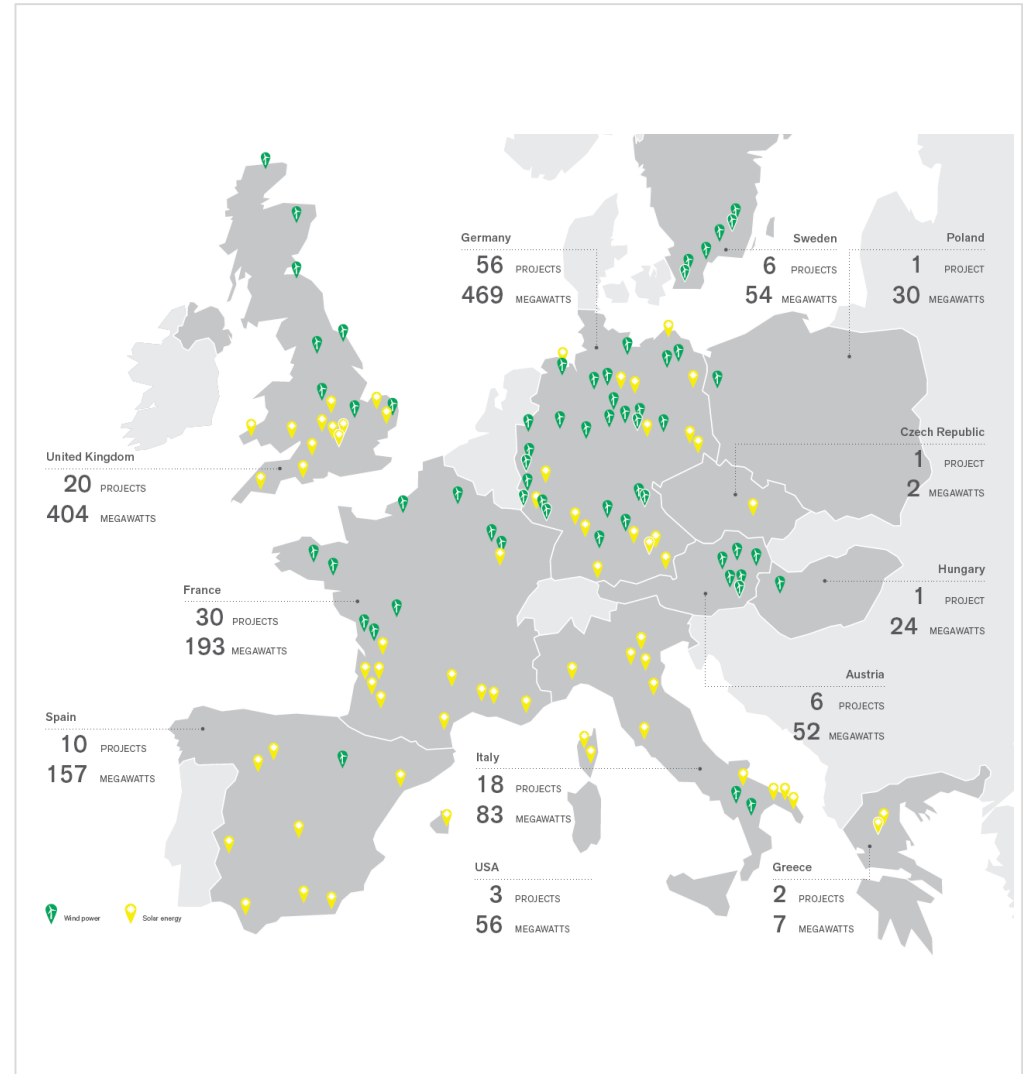
- 52 wind farms
- Installed power approx. 760 MW

O&M PV

- 220 ground mounted and roof top PV plants
- Approx. 540 MWp capacity

Technical and commercial management

- Supporting PV and wind investors in diverse fields
- Diverse projects involvements reaching from commercial management to the owner's representation with power of attorney



Replacement Strategies – Common practice

- High degree of uncertainty in the industry regarding the legal interpretation of the EEG
- Especially definition of “array” with respect to replacing individual modules lead to confusion
- In the market, various replacement strategies have been applied depending on
 - Legal compliance / potential degree of legal non-compliance
 - Degree of complexity / costs

Legal reference module exchange:

§ 32 Abs. 5 EEG 2012

§ 17 Abs. 2 Nr. 1 EEG 2012

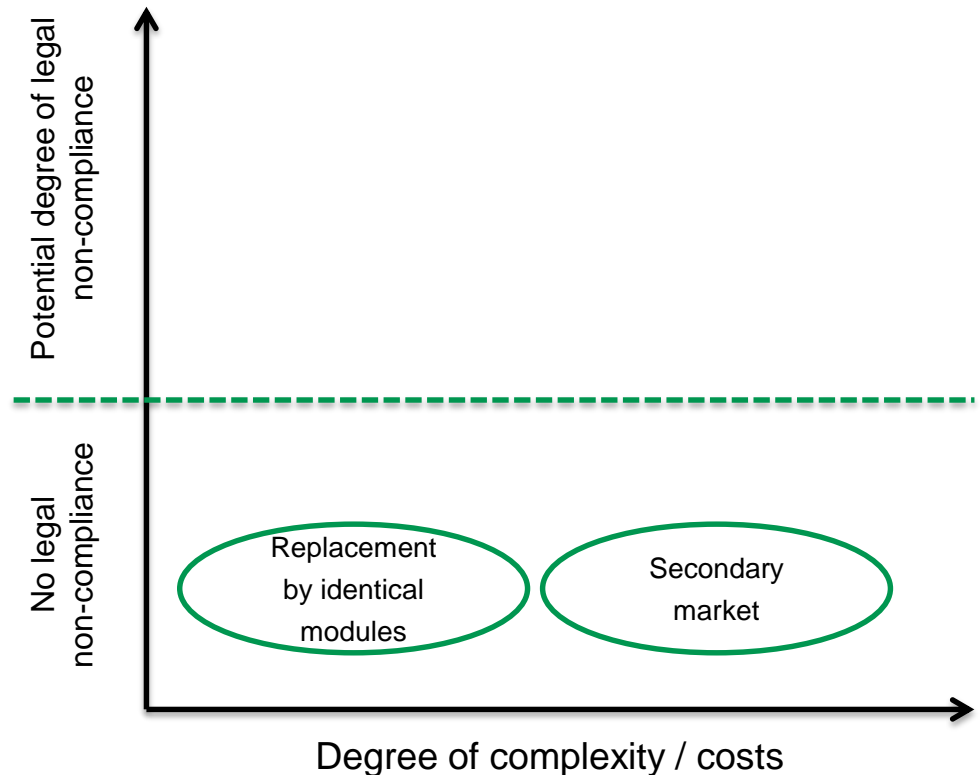
§ 51 Abs. 4 EEG § 25 Abs. 1 Nr. 1 EEG 2014 with respect to § 5 Abs. 2 and 3, § 6 Abs. 1



Replacement Strategies – Common practice

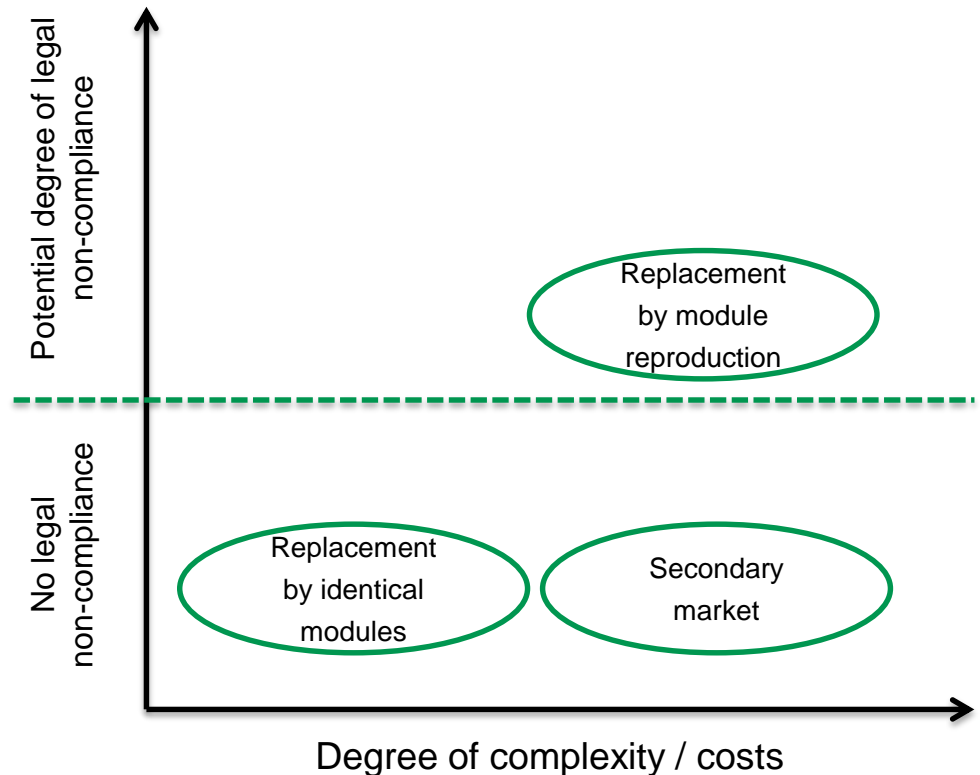
- Replacement by identical modules
 - Modules directly available from manufacturer / on stock
 - Higher cost compared to today's average market prices

- Secondary market
 - Warranties sit with the manufacturer, not with the wholesaler
 - Higher cost compared to today's and historic average market prices



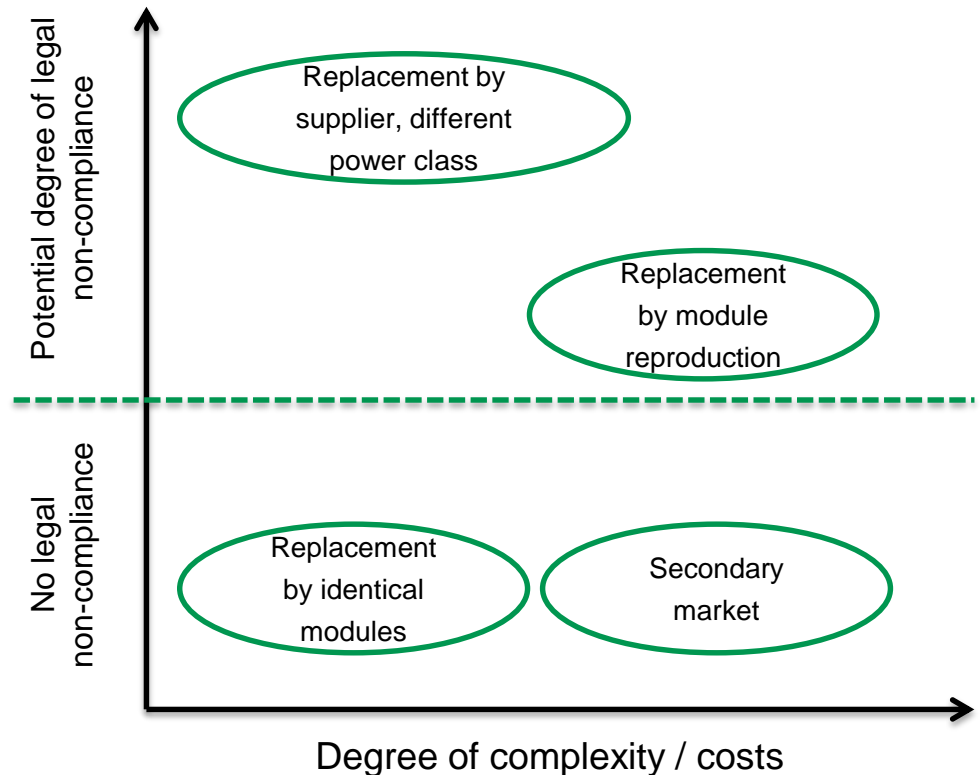
Replacement Strategies – Common practice

- Replacement by module reproduction
 - Identic mechanical size
 - Comparable electrical parameters
 - Identic optical appearance
 - Increased module costs



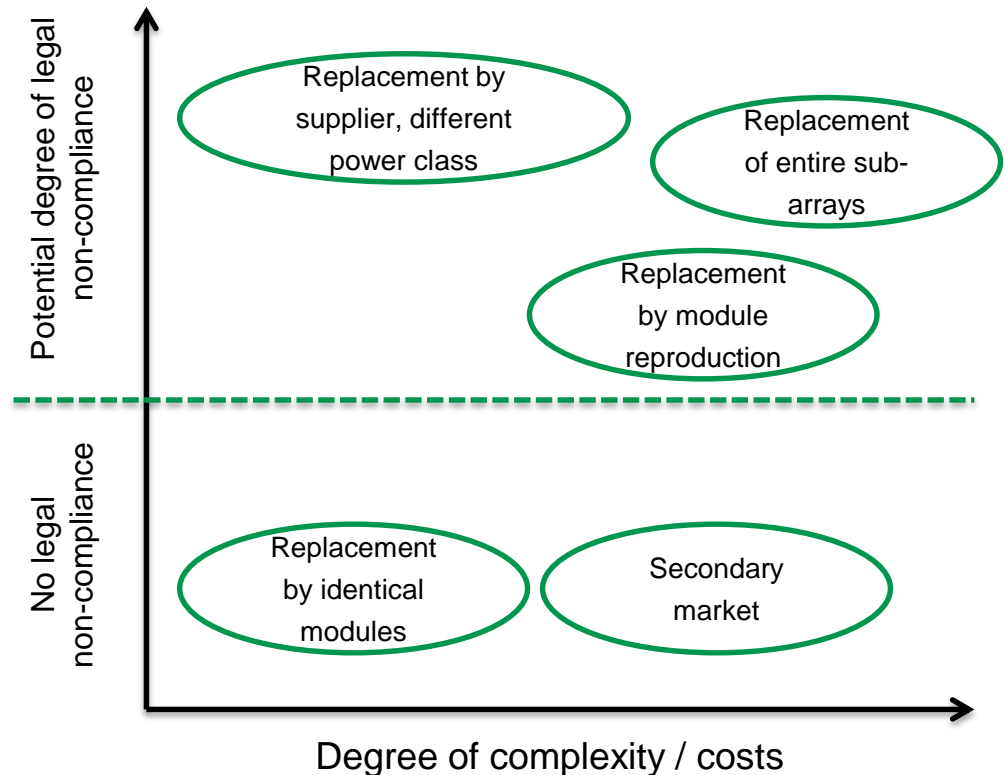
Replacement Strategies – Common practice

- Replacement by same supplier, different power class
 - Identic mechanical size
 - Identic optical appearance
 - Exceeding installed capacity [Wp]
- Justification for procedure
 - Degradation
 - String output limited by lower module power classes



Replacement Strategies – Common practice

- Replacement of entire sub-arrays, i.e. entire strings to create module swap pool
 - By same supplier, different power class (see slide 7)
 - By module reproduction (see slide 8)
 - Avoidance non-compliance: less installed capacity [Wp] in one string acceptable
- Module swap pool
 - Total legal compliance with these modules
 - Swap pool modules available for single module defects in other strings



Advice of the German clearing house (“Clearingstelle EEG”)

- Due to confusion in the industry, the clearing house published this advice “Hinweis 2015 / 7” including detailed interpretation on 16th June 2015.
- Definition of “array” is critical (“Anlagenbegriff”)
An array is defined as every individual module, but for the replacement it is not required to substitute individual modules.

Reference EEG Clearingstelle “Hinweis 2015 / 7”

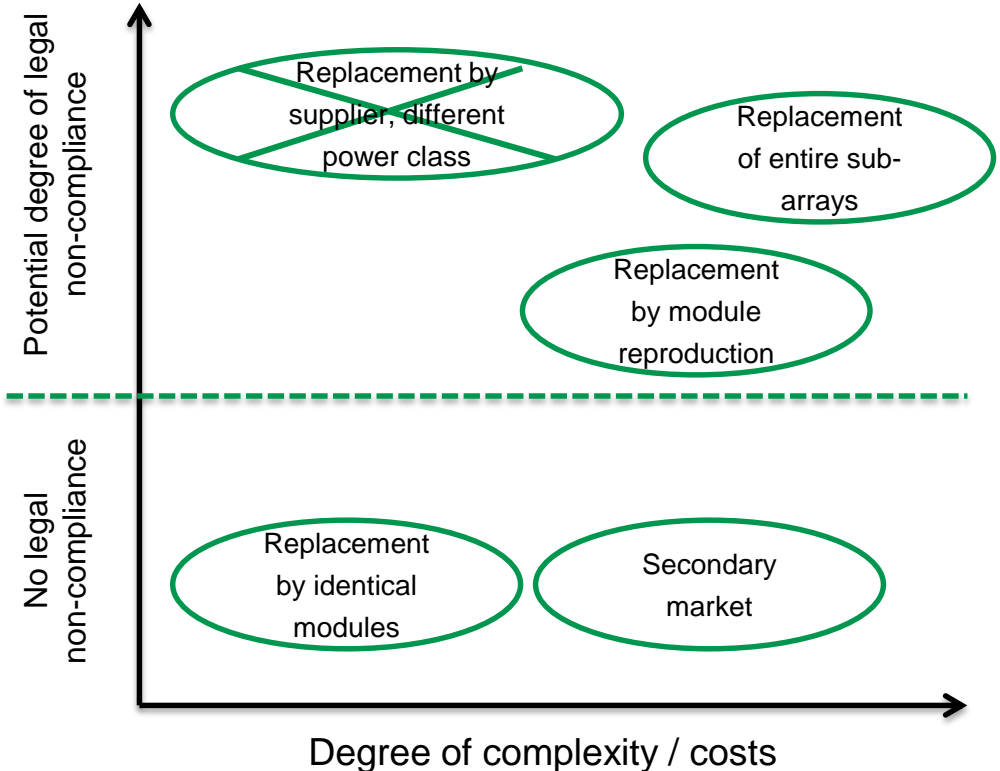
https://www.clearingstelle-eeq.de/files/Hinweis_2015_7.pdf § 17 Abs. 2 Nr. 1 EEG 2012



Advice of the German clearing house (“Clearingstelle EEG”)

Summary

- The installed capacity [Wp] must remain capped
- The four before mentioned strategies are in line with the advice, except exceeding the capacity [Wp]
- The module defect is precisely defined in the advice
- The advice “Hinweis 2015/7” should be followed



Advice of the German clearing house (“Clearingstelle EEG”)

Notification obligations

- DNO distributed network operator (“Netzbetreiber”)
 - Every replacement must be notified
 - The module defect must be explained and proven – i.e. string or inverter data analysis is sufficient, I-V-measurements or IR-imaging is not required
 - A commissioning report is not mandatory, but recommended.

- German federal grid agency (“Bundesnetzagentur”)
 - To be notified only if the installed capacity changes, which has been initially notified (more or less capacity [Wp])
 - If more capacity [Wp] is installed after replacement, the additional capacity [Wp] will be sold for energy market prices

