

## PEARL TF-PV

### Performance and Electroluminescence Analysis on Reliability and Lifetime of Thin-Film Photovoltaics

*Project Duration: 07.2017 to 06.2020*  
*Initial report submitted: 02.2018*

#### Summary

Renewable energy assets are characterised by a high initial investment, long payback times and low operational costs. This is especially true for PV plants. PV modules represent up to 50% of the investment, and module reliability is crucial for the economic success of the plant. Each unexpected yield reduction or increase in maintenance expenses will seriously threaten the economic viability of the plant.

Pre-installation testing and field inspection can reduce investment risks and increase plant yield. For silicon wafer technologies, there exists a generally accepted set of standards for rejecting modules that are unlikely to perform to specification. However for thin film, it is not yet understood how to interpret the test results. This introduces uncertainty into investment models and maintenance reserve estimates, in turn reducing bankability of thin film PV projects.

The PEARL TF-PV project aims to reduce the cost of electricity produced by thin-film PV power plants, by improving plant reliability, yield, and prediction of overall plant lifetime using electroluminescence imaging methods.

The knowledge gain on the appearance, behaviour and progression of failure mechanisms acquired during this project will be implemented to strengthen the productivity and competitiveness of European industry within the O&M and quality assurance industry, as well as within the thin film research and manufacturing sector.

#### Project consortium

Coordinator and contact details:

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Participating countries and financing:

Country	Number of organisations involved	Project costs in EUR	Public funding in EUR
Germany	3	1'517'905	1'273'137
The Netherlands	6	902'762	722'208
Austria	2	330'824	273'660
<i>Total</i>	<i>11</i>	<i>2'751'491</i>	<i>2'269'005</i>

## Funding agencies involved and contracts

Funding Agency	Contract N° and Title
Bundesministerium für Wirtschaft und Energie	Contract Nu: 0324193A Verbundvorhaben: 'PEARL TF-PV - Leistungs- und Elektrolumineszenz-analyse auf Zuverlässigkeit und Lebensdauer der Dünnschicht-Photovoltaik' Teilvorhaben: 'Statistische Analyse der Verlässlichkeit und Lebensdauer von Dünnschicht PV Modulen mittels Leistungs-bewertung und Elektrolumineszenz'
Österreichische Forschungsförderungsgesellschaft mbH, FFG (on behalf of Klima- und Energiefonds)	Contract Number: 858495 Performance and Electroluminescence Analysis on Reliability and Lifetime of Thin-Film Photovoltaics
Rijksdienst voor Ondernemend	Contract Number: TEUE116203 Performance and Electroluminescence Analysis on Reliability and Lifetime of Thin-Film Photovoltaics
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Bundesministerium für Wirtschaft und Energie	Contract Nu: 0324193B Verbundvorhaben: 'PEARL TF-PV - Leistungs- und Elektrolumineszenz-analyse auf Zuverlässigkeit und Lebensdauer der Dünnschicht-Photovoltaik' Teilvorhaben: Kostenreduktion in Dünnschicht PV-Anlagen durch zu entwickelnde O&M Maßnahmen mit verbesserter und effizienterer Fehleranalyse
Bundesministerium für Wirtschaft und Energie	Contract Nu: 0324193C Verbundvorhaben: 'PEARL TF-PV - Leistungs- und Elektrolumineszenz-analyse auf Zuverlässigkeit und Lebensdauer der Dünnschicht-Photovoltaik' Teilvorhaben: Identifizierung von Dünnschichtsolarmodulen im Labormaßstab mit Elektrolumineszenz-untersuchungen

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