

DURACIS

Advanced global encapsulation solutions for long term stability in industrial flexible Cu(In,Ga)Se₂ photovoltaic technology

Project Duration: 09.2017 to 09.2020

Initial report submitted: 09.2017

Summary

For a cost-competitive full market entry, flexible CIGS PV technologies require the availability of innovative encapsulation solutions with both very low costs and excellent barrier properties guaranteeing a long operating time of the devices. Even if there are already existing solutions with acceptable performance levels, costs remain a relevant issue that needs to be solved in order to keep the stringent cost reduction targets established for these technologies. To solve these problems, DURACIS will explore new alternative encapsulation and optical glue materials and concepts, compatible with their implementation into already existing industrial CIGS pilot lines and allowing a significant extension of the lifetime while substantially reducing costs. To achieve this goal, transfer of concepts previously developed for organic technologies (with very stringent encapsulation requirements) will be investigated.

The final goal of DURACIS is the development of a novel encapsulation technology with costs below 15 €/m² and ensuring a durability higher than 25 years for flexible CIGS devices. The project will adopt a global strategy including solutions for the main industrial substrate technologies that have been developed for flexible CIGS (polyimide, steel substrates) and will also include the analysis of their transfer into industrial pilot lines available in the consortium. The implications of the different kinds of substrates on these new encapsulation concepts will be specifically addressed aiming at the development of optimized cost efficient solutions compatible with very long term stability.

The project will also include the development of advanced methodologies for the non-destructive monitoring of the encapsulation processes and layers. This involves both monitoring of the deposition processes as well as the definition of fast methodologies for detection of potential degradation effects affecting the encapsulation and device lifetime.

Project consortium

Coordinator and contact details:

Full name of organisation:	Fundació Institut de Recerca de l'Energia de Catalunya
First and family name of coordinator:	Alejandro Pérez-Rodríguez
Full address:	C Jardins de les Dones de Negre 1, 2a planta 08930 Sant Adria de Besòs (Barcelona), Spain
E-mail:	aperezr@irec.cat

Participating countries and financing:

Country	Number of organisations involved	Project costs in EUR	Public funding in EUR
Spain	2	364'410	185'750
France	2	346'342	178'982
Belgium-Wallonia	2	410'221	269'423
Germany	1	455'433	455'433
Austria	3	316'747	212'128
<i>Total</i>	<i>10</i>	<i>1'893'153</i>	<i>1'301'716</i>

Funding agencies involved and contracts

Funding Agency	Contract N° and Title
Agencia Estatal de Investigación - APCIN 2017	PCIN-2017-041 – DURACIS
Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME)	N° 1705C0009 - DURACIS
Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME)	N° 1705C0009 - DURACIS
Service Public de Wallonie	1610058 - DURACIS
Service Public de Wallonie	1610058 - DURACIS
Bundesministerium für Wirtschaft und Energie (BMWi) (via Projektträger Jülich, PTJ)	0324207 - Neuartige Verkapselungslösungen zur langzeitstabilen industriellen Verkapselung flexibler Cu(In,Ga)Se ₂ Photovoltaik
FFG-Österreichische Forschungsförderungsges.m.b.H	858494 – DURACIS
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