APOLLON
Multi-APprOach for high efficiency integrated and inteLLigent cONcentrating PV modules (Systems)

Deliverable 7.10 Publication of environmental LCI dataset

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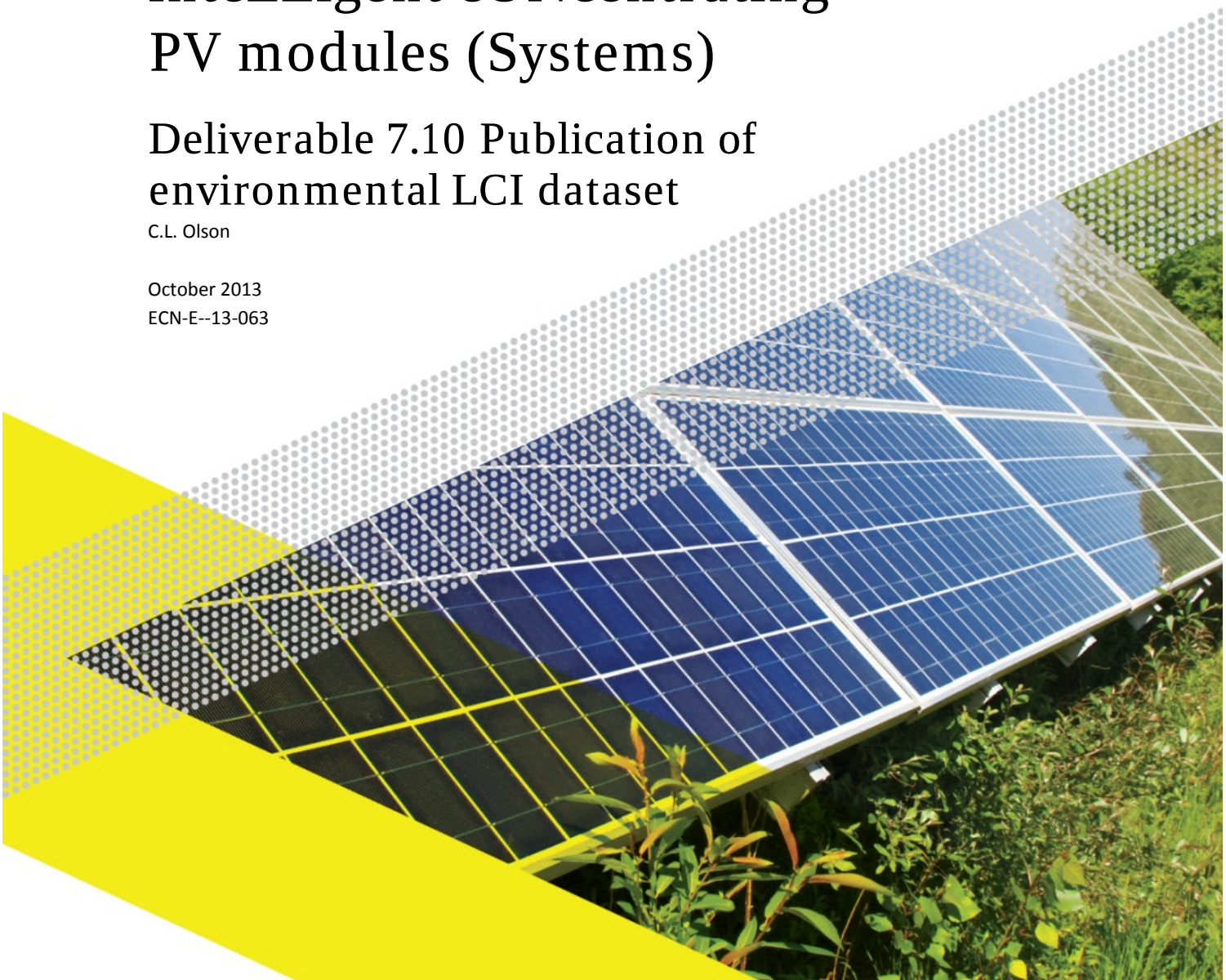

Acknowledgement

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Contents

Summary

This deliverable makes available the life-cycle inventory used to calculate the energy payback time and the carbon footprint of the Apollon final concentrating photovoltaics (CPV) design developed.. The data below relates to one Apollon module.
The results are to be published in Environmental Science and Technology, in a paper," Sustainability of Materials and Costs of Materials in a Mirror-based Concentrating Photovoltaic System" .
Reference is made to the results for the Spectrolab triple junction solar cell in the following two studies:
[1] [2]

[1] V. M. Fthenakis and H. C. Kim, "Life cycle assessment of high-concentration photovoltaic systems," *Prog. Photovolt: Res. Appl.,* vol. 21, pp. 379-388, 2013.

[2] . H. C. Kim, . K. G. Knight, . N. Krishnan and V. Fthenakis, "Life Cycle Analysis of Two New Concentrator PV Systems," in *23rd European Photovoltaic Solar Energy Conference*, Valencia, Spain, 2008.

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Life cycle inventory for 1 Apollon CPV module

input file name	total kg	CED (MJ)	GWP
Aluminium extrusion profile, primary prod., prod. mix, aluminium semi-finished extrusion product RER S	11,01	449,8	25,2
Aluminium sheet, primary prod., prod. mix, aluminium semi-finished sheet product RER S	16,49	939,2	41,7
aluminum coating,metal sheet, physical vapour deposition	0,000	29,2	0,1
Anodising, aluminium sheet/RER U	0,000	158,6	0,4
Bisphenol A, powder, at plant/RER U	0,097	13,4	0,5
Cast iron, at plant/RER U	0,000	0,0	0,0
Copper product manufacturing, average metal working/RER U	0,269	0,0	0,0
Copper, at regional storage/RER U	0,295	54,7	2,9
Diethylene glycol, at plant/RER U	0,059	2,1	0,1
Diode, glass-, SMD type, surface mounting, at plant/GLO U	0,001	5,4	0,3
Epichlorohydrin, from hypochlorination of allyl chloride, at plant/RER U	0,040	3,0	0,1
Epoxy resin, liquid, at plant/RER U	0,022	1,2	0,1
Galvanized steel sheet, at plant/RNA	0,696	22,2	2,0
Gold, at regional storage/RER U	0,000	60,7	3,7
Lead, at regional storage/RER U	0,000	0,0	0,0
Methanol, at plant/GLO U	0,596	22,4	0,0
Mounting, surface mount technology, Pb-containing solder/GLO U	0,000	0,3	0,0
Phosphorus, white, liquid, at plant/RER U	0,000	0,0	0,0
Polycarbonate granulate (PC), production mix, at plant RER	0,033	3,5	0,3
Printed wiring board, mixed mounted, unspec., solder mix, at plant/GLO U	0,143	212,0	12,4
Production efforts, diodes/GLO U	0,000	5,3	0,3
Silicon tetrachloride, at plant/DE U	0,775	31,9	0,1
Silicone product, at plant/RER U	0,075	4,7	0,2

Sodium hydroxide, production mix for PVC production, at plant, 100% NaOH RER	0,016	0,3	0,0
Solar glass, low-iron, at regional storage/RER U	8,512	124,4	9,3
Stainless steel hot rolled coil, annealed & pickled, elec. arc furnace route, prod. mix, grade 304 RER S	0,861	42,9	5,0
Tin plating, pieces/RER U		0,9	0,1
Tin, at regional storage/RER U	0,000	0,0	0,0
Titanium dioxide, chloride process, at plant/RER S	0,448	42,0	0,7
Transport, freight, rail/RER U		4,8	0,3
Transport, lorry >16t, fleet average/RER U		7,2	0,4
Zinc, primary, at regional storage/RER U		0,0	0,0

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