

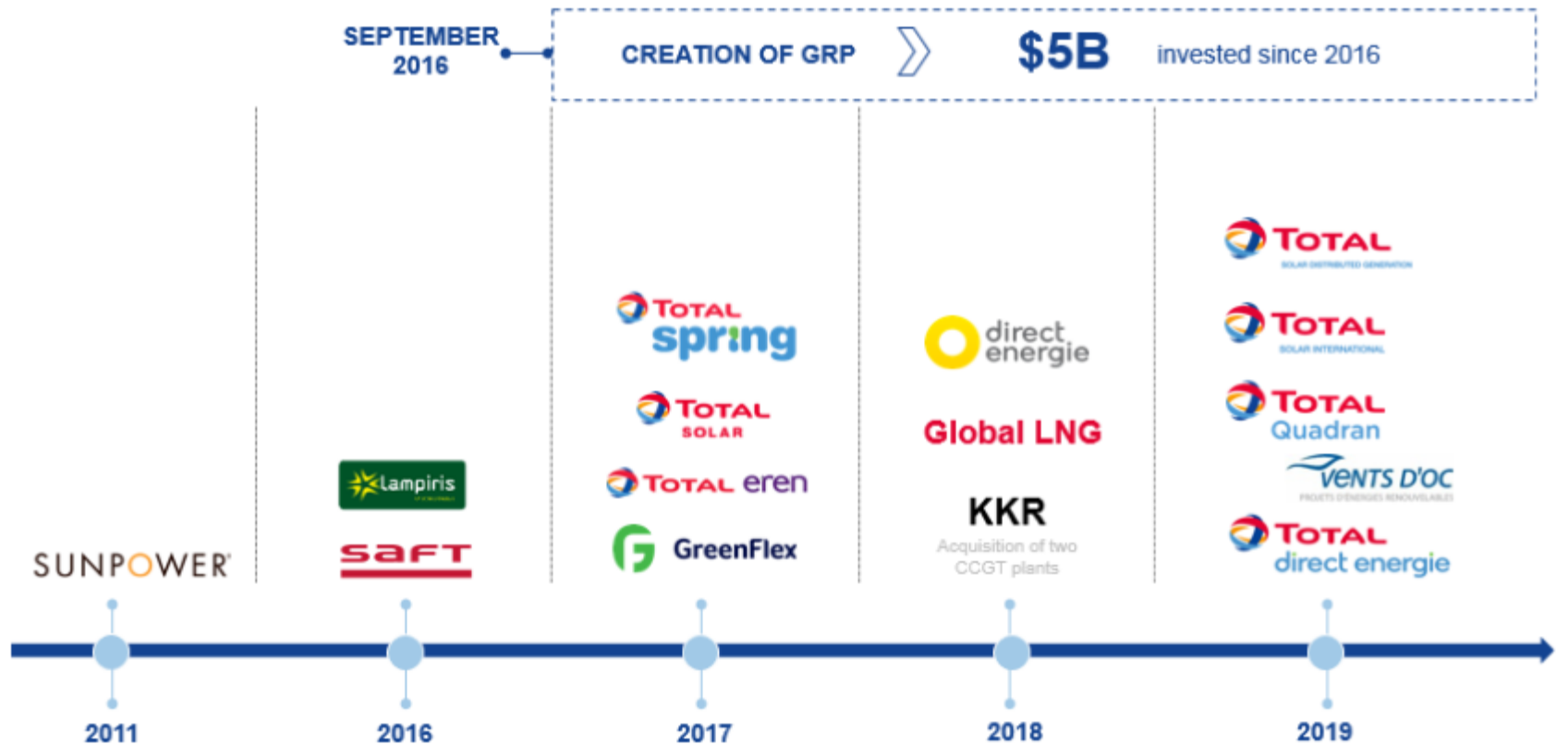


CIRCULAR ECONOMY IN PV FIELD

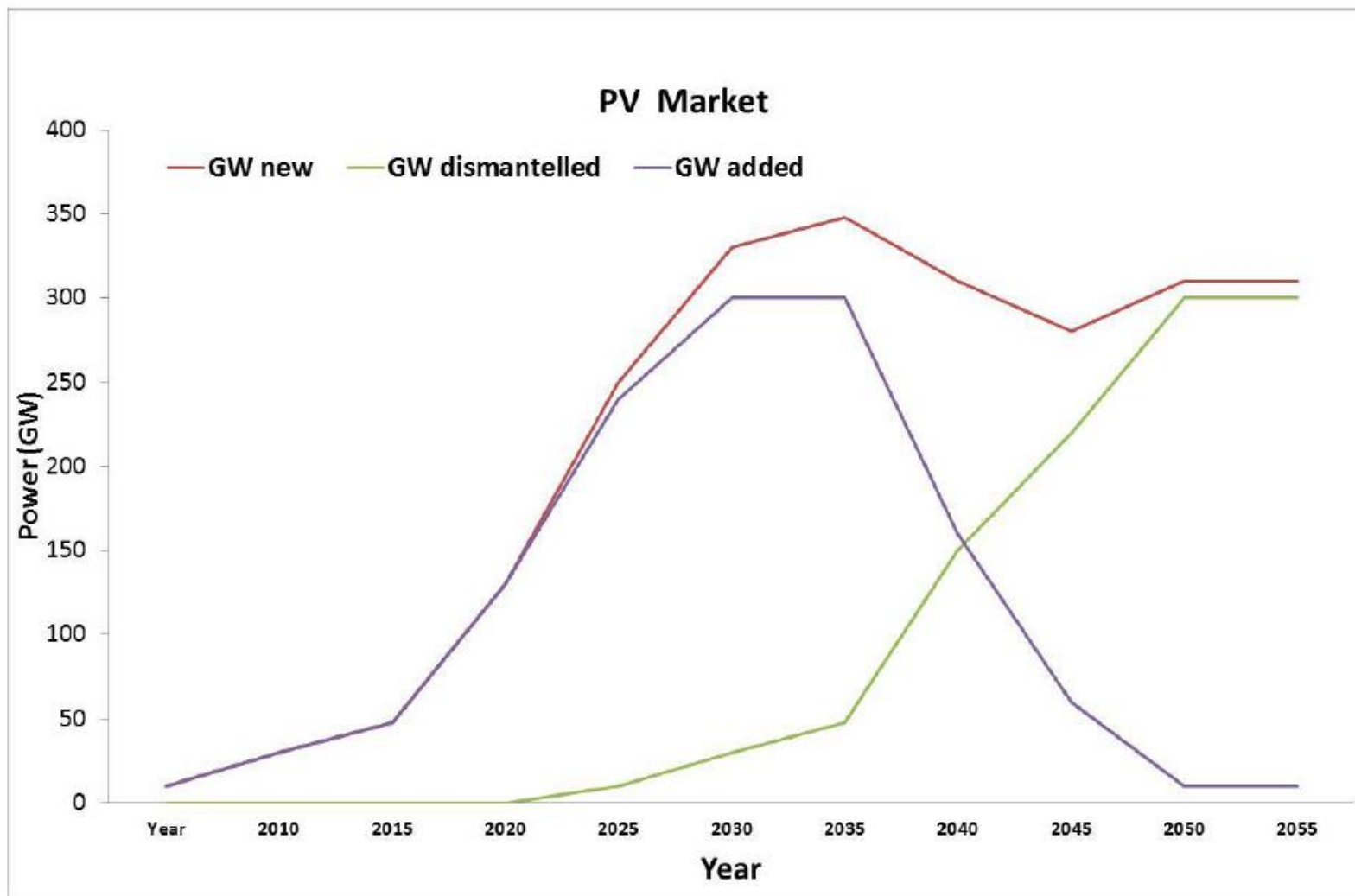
OFATE 18 June 2020

TOTAL GRP – GAS, RENEWABLE AND POWER

FAST-PACED GROWTH

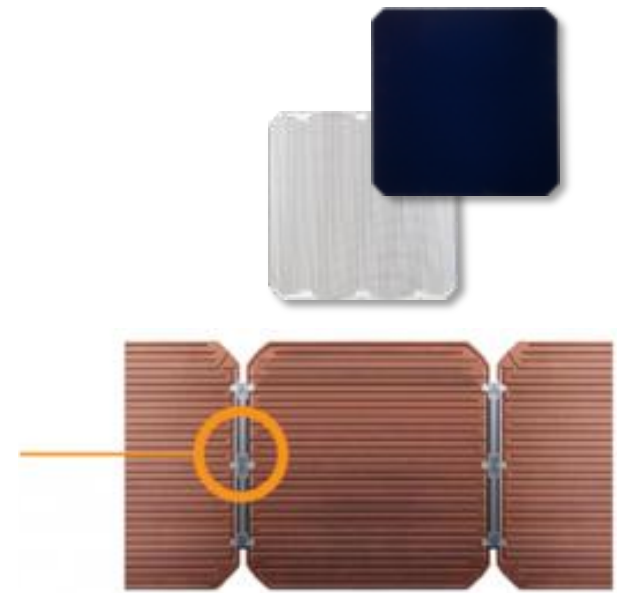
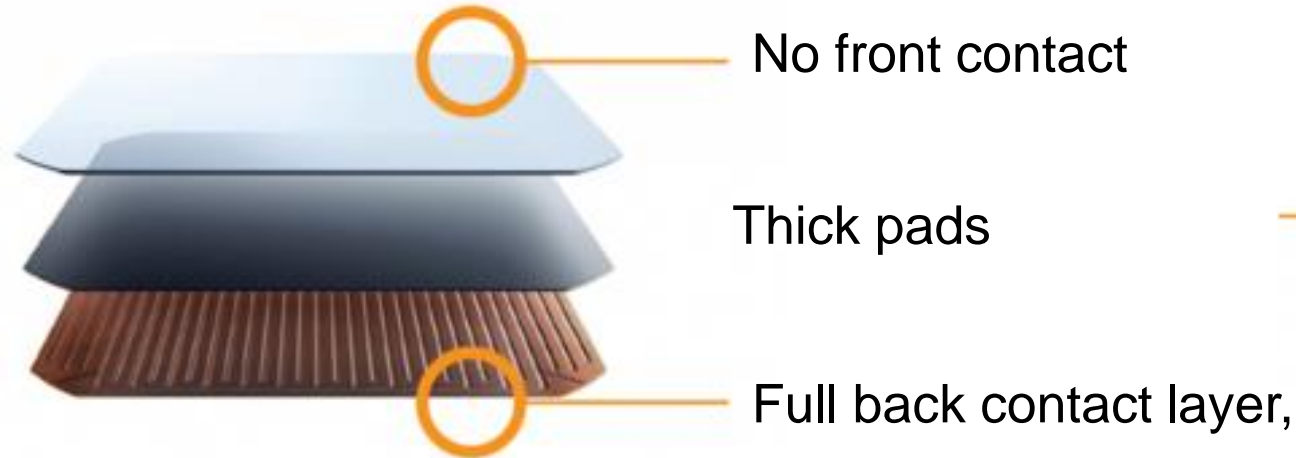


END OF LIFE VOLUMES



Jean-Pierre Joly 2016 – CEA ECO PV Workshop

SPWR PRODUCT SPECIFICITY – IBC [INTERDIGITATED BACK CONTACT



- **Highest industrial cell efficiency - 25%**
- **Better reliability through lowest degradation rate**
- **Longest product warranties**
- **Lower silicon consumption**
- **No heavy metals, cradle to cradle silver module plants**

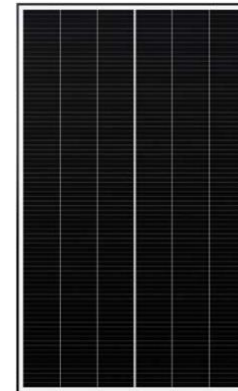
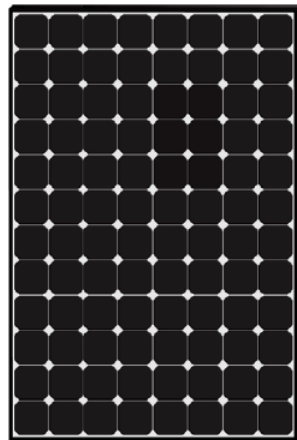
SPWR PRODUCTS

	Maxeon 2	Maxeon 3	Maxeon 5	P series
Weight kg	19	19	21,1	23,1
Cell #	104	104	72	81
Power	360	400	450	400

LEED: Gold



Cradle to Cradle: Bronze or Silver



Power density

201 W/m²

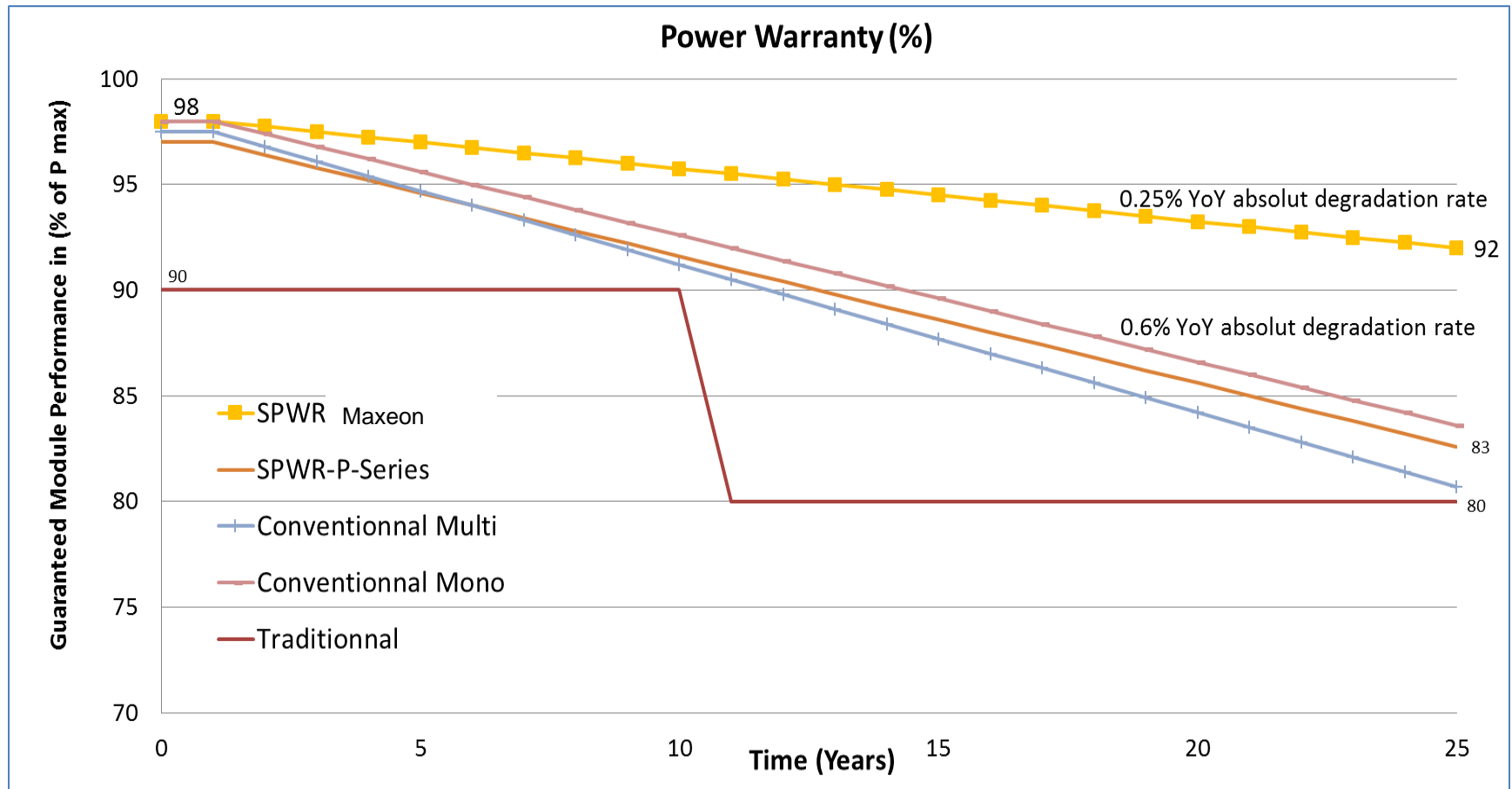
220 W/m²

223 W/m²

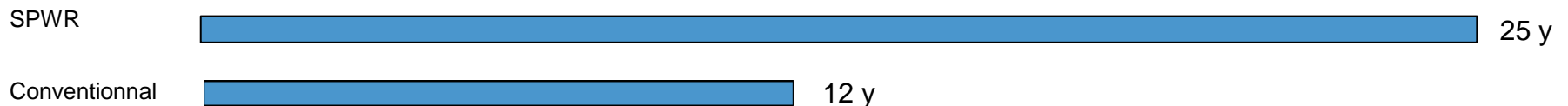
193 W/m²



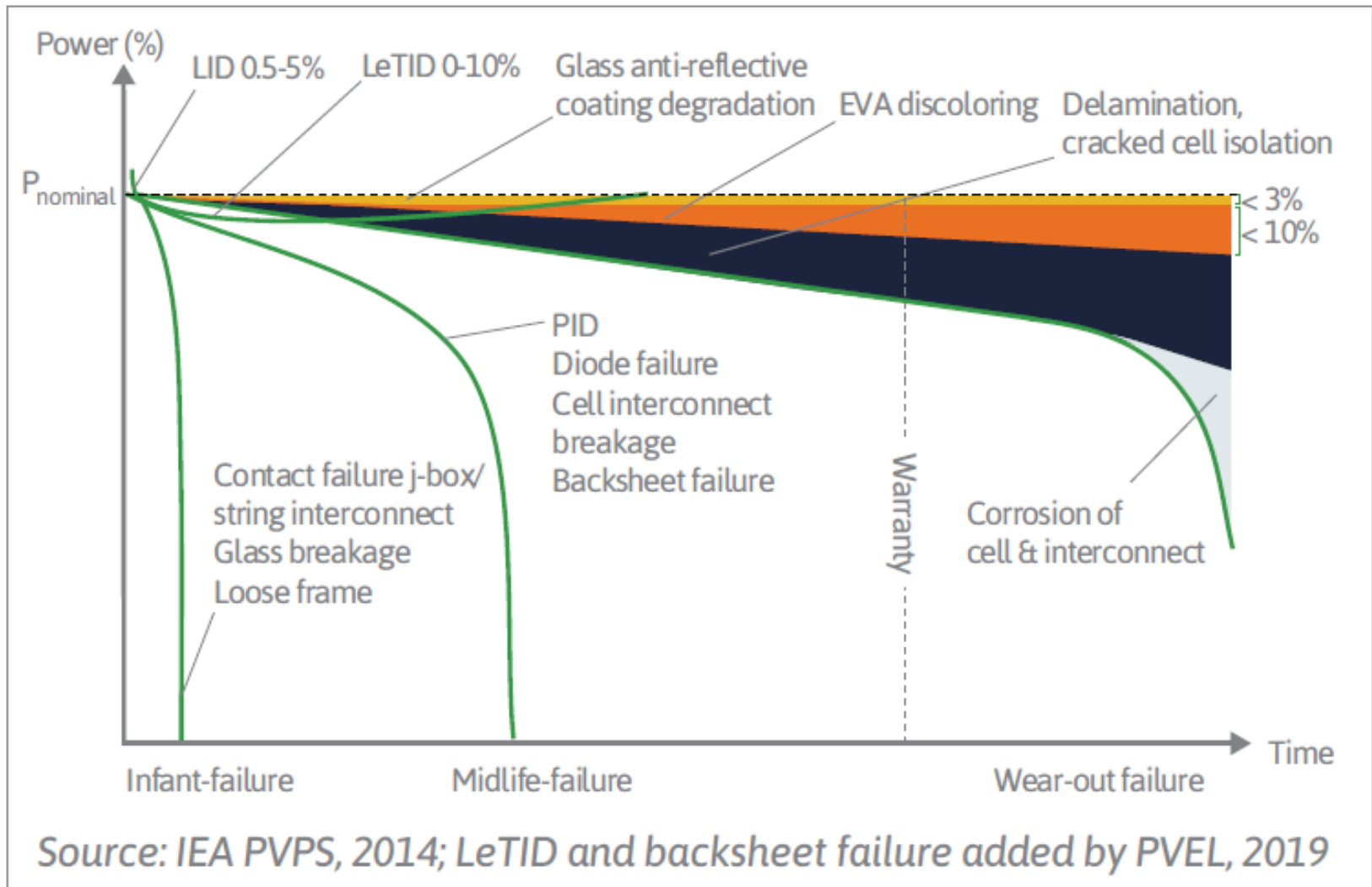
BANKABILITY – WARRANTY MAXEON



Product Warranty

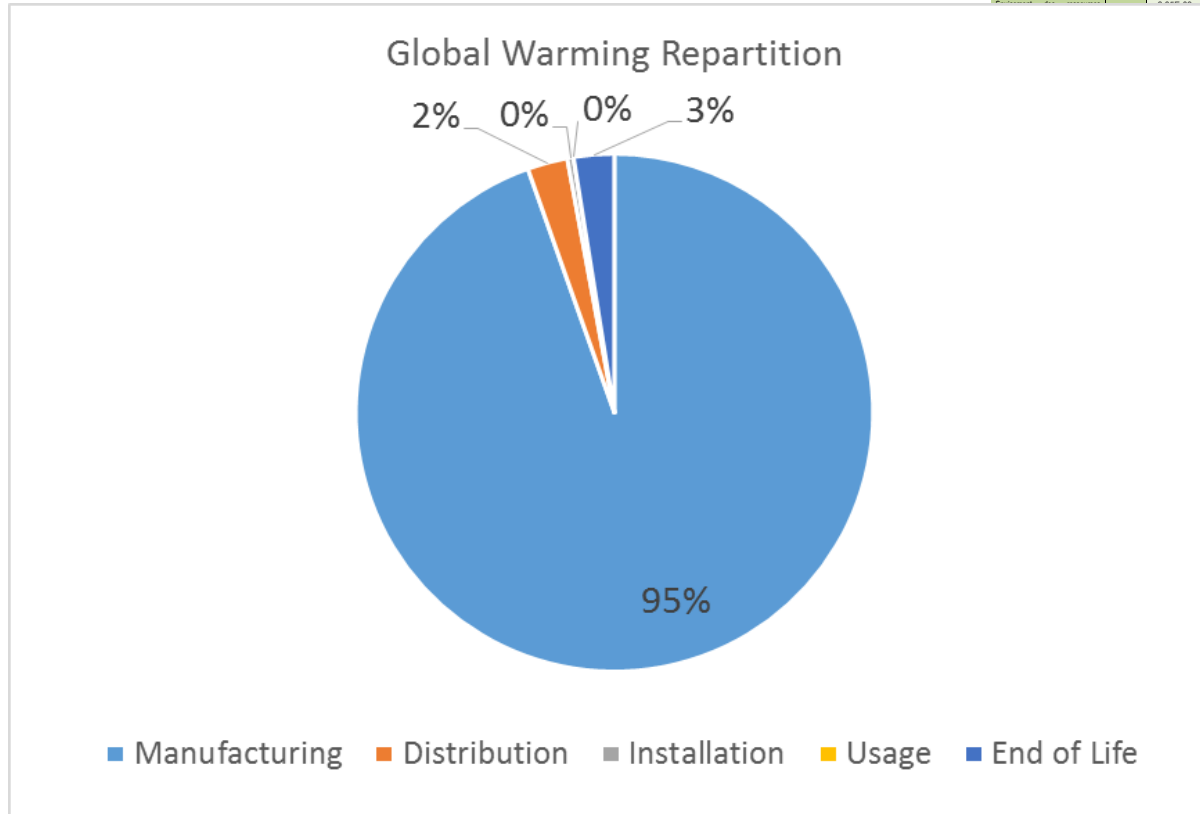


MODULE FAILURE MODES



END OF LIFE IN ENVIRONMENTAL IMPACTS

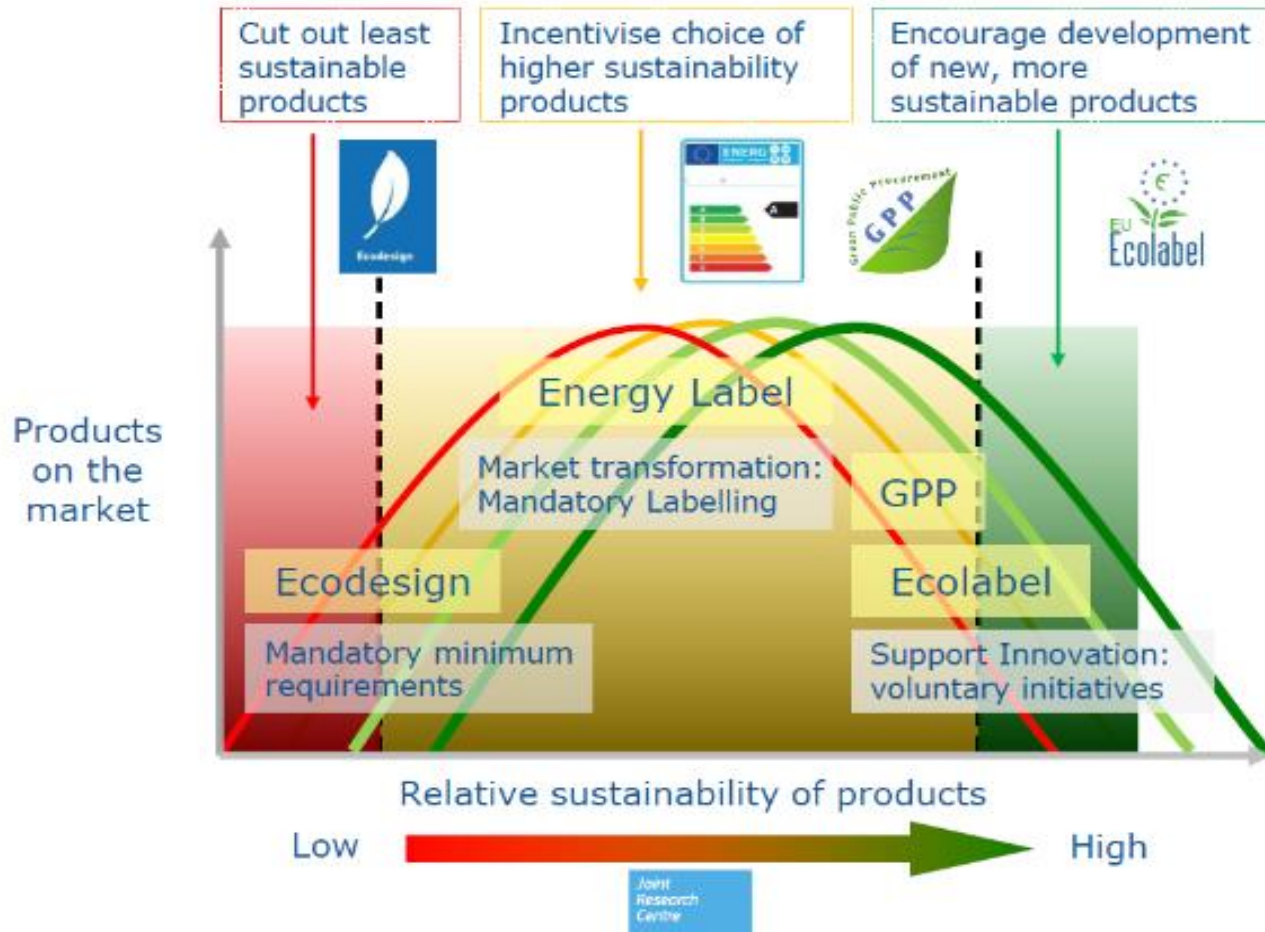
INDICATEURS OBLIGATOIRES							
Indicateur	Unité	Total / équipement	Étape de fabrication	Étape de distribution	Étape d'installation	Étape d'utilisation	Étape de fin de vie
Réchauffement climatique	kg CO ₂ eq	1,14E+02	1,08E+02	2,87E+00	4,45E-01	0,00E+00	2,89E+00
Destruction de la couche d'ozone	kg CFC-11 eq	8,15E-05	8,09E-05	5,04E-07	8,26E-09	0,00E+00	1,05E-07
Acidification des sols et de l'eau	kg SO ₂ eq	5,55E-01	5,25E-01	2,85E-02	2,19E-04	0,00E+00	1,24E-03
Eutrophication	kg PO ₄ -3 eq	9,61E-02	9,28E-02	2,95E-03	5,90E-05	0,00E+00	2,75E-04
Formation d'ozone photochimique	kg CH ₄ eq	7,65E-02	7,39E-02	2,41E-03	3,38E-05	0,00E+00	1,47E-04
			55E-03	5,80E-06	2,23E-07	0,00E+00	6,80E-07
			96E+03	4,39E+01	7,21E-01	0,00E+00	6,45E+00
			97E+00	8,20E-03	8,57E-04	0,00E+00	5,71E-03



POLICY



Overlay of EU product policy instruments



CIRCULAR ECONOMY REMAINS A GRAAL

- End of life studied – several options

- Repowering
- Prolongation
- Dismantling

Will be influenced by cost considerations, module state evaluations, regulation. – need for long term module characterisation, End of life REX.

- Modules for circular economy

- Design options, ecodesign
- Recycling Processes