

POLICY STATEMENT

SOLAR MANUFACTURING RENAISSANCE IN EUROPE — APPEAL FOR RRF COMMITMENT

A communication compiled by the European Solar Manufacturing Council (ESMC)



The European Solar Manufacturing Council (ESMC) is the organisation representing the interests of the European PV manufacturing industry. The ESMC represents key industrial companies, organisations and research centers active in the PV sector rooted in Europe. ESMC aims at promoting and supporting the PV manufacturing industry and its value chain at the European level, speaking with one voice.

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I. ESMC POLICY PROPOSITION

MESSAGE TO THE EUROPEAN STAKEHOLDERS ON RRF: WHAT SHOULD BE DONE TO MANUFACTURE SOLAR TECHNOLOGIES IN EUROPE?

The combination of European Green Deal targets, a post-Covid-19 environment and the EU Recovery and Resilience Facility (RRF) creates unique opportunities for Europe to strengthen and restore the value chains and industries. RRF should take into consideration the strategically important European Photovoltaic (PV) industry by concrete and targeted policy and financial measures. As PV is a clean and powerful solution to provide jobs, economic growth, and European energy security as well as address climate change, RRF could catalyze a real chance for the PV industry in Europe for accelerated growth.

The Statement provides an evaluation of the unused PV manufacturing potential, sector development vision towards 2026 and beyond and proposes 5 concrete actions to lead towards a PV manufacturing renaissance in Europe.

ESMC believes that 75% of European PV installations should be manufactured in Europe, and two thirds of the production exported outside Europe. This would amount to about 60 GW of manufacturing capacity and a full production utilization in Europe by the end of the RRF cycle – 2026. As a consequence, firstly, the current 7.4 billion euros trade deficit of PV cells and modules would be transformed into local PV manufacturing value of about 50 billion euros by 2026. Secondly, around 178 000 additional jobs would be created by 2026, half of them – in the PV upstream sector. This European PV manufacturing vision is an inseparable part of both – the EU Green Deal transition and the EU economy transformation. RRF support towards PV manufacturing could be directed towards three key pillars: firstly, for the PV manufacturing equipment and infrastructure, secondly, for R&D and new products deployment, thirdly, for dedicated special financial funds. 20 billion euros (or 3%) of the total RRF financing would ensure the real breakthrough for the European PV manufacturing leading to all positive consequences mentioned above and explained in detail below, including generating at least 50 billion euros of local manufacturing pay-back value only until 2026.

ESMC proposes 5 concrete steps to empower RRF to rebuild the PV industry in Europe and ensure long-term European PV technology and industry development with large export potential.

- 1. At least 8% of RRF financing of the minimum 37% of Climate investments and reforms (i.e. a minimum of 3% of the total RRF budget) should be dedicated to PV manufacturing¹ in Europe, with the clear target to develop critical mass production capacities along the whole value chain.**

The current PV production capacities should be expanded massively to serve the European market demand with a long-term goal to have at least balanced export and import volumes with consistently growing export at the end of the RRF implementation period – 2026.

- 2. Member States should have the possibility to foster investments in both, development of renewable energy sources (RES) capacities and PV manufacturing capacities – equally. RRF grants for PV manufacturing are indispensable from the inclusion of PV manufacturing into Important Projects of Common European Interest (IPCEI). Targeted actions of Member States should use both instruments – grants and IPCEI – to unlock the economic potential for European PV manufacturing.**

Long-term and sustainable PV manufacturing should be promoted by Member States, while the European Commission should encourage the Member States to invest in the PV manufacturing sector when evaluating the national Recovery and Resilience Plans (RRP). The European Commission requires Member States to use both – quantitative (37%) and qualitative approaches to explain how their national RRP contribute to broader environmental objectives. This qualitative approach should be balanced not only horizontally (i.e. between different climate and environmental sectors), but also vertically (i.e. between PV installations and PV manufacturing).

- 3. Separate and specific financial support programs for PV manufacturing capacities and equipment in Power up section of the national RRP at the level of components should be created by the Member States (see page 10 for the concrete standard example to the Member States).**

Special components in national RRP dedicated to the PV manufacturing value chain should be directed towards expansion of existing production capacities as well as development of new production capacities to strengthen the overall European PV manufacturing value chain.

- 4. Solar PV manufacturing could become one of the exemplary Green Deal industrial scale-up projects of the RRF, ensuring synergies among different sections of RRF for the Member States.**

The separate components in the national RRP of the PV manufacturing value chain should be eligible for the status of the structural reforms in the Member States, as it includes the transformation towards green energy and industry, renovation wave and transport decarbonisation. The European Commission already invited Member States to consider to what extent the relevant reforms and investments financed by the RRF will help make the EU more resilient, in particular, regarding critical value chains, while implementing the vision of the EU's open strategic autonomy. PV manufacturing should lead this inter-sectional transformation and embody the EU's open strategic autonomy.

- 5. Grants, loans or loans guarantees of the RRF should be focused to work in support of the European PV manufacturing industry to achieve critical mass capacities (at least 60 GW) soon enough (latest 2026) to establish sustainable competitiveness of the PV manufacturing industry.**

Grants should be made available for PV manufacturing projects to signal strong support to the investor and financial markets, as well as ensure the accelerated deployment of projects within the available 2-to-4-year timeframe. Credit guarantees or loans under the RRF should further ensure the necessary private investment and finance for achieving the targeted critical mass across the PV manufacturing value chain.

¹ PV manufacturing includes industrial production facilities along the whole value chain, i.e. from materials, components up to the final PV module along with components necessary for a complete PV system such as inverters and mounting structures.

II. SUPPORTIVE FACTS & FIGURES

1. PERFECT MOMENTUM WITH A LIMITED WINDOW OF OPPORTUNITY

The Covid-19 lessons proved that we cannot systematically rely on imports for key parts of our value chains including for PV technology. It has clearly shown that without local manufacturing of strategic energy technologies and a substantial share of local content there is no technological and energy security and no added values for the economy and society. Difficulties to procure *ad hoc* equipment at a reasonable price in European countries emerged when traditional global trade options were, and still are, under pressure. **As PV's share of the electricity mix is increasing and PV is becoming one of the most important energy sources for the economy, it is of strategic importance to have a regional and local PV value chain.** PV manufacturing would not only empower a fast and sustainable green transformation, including European renovation wave, but also lead Europe's economy through the transformation as this will also generate huge added value in terms of economic growth, industrial jobs, revenues for national budgets and science & research development in Europe.

The EU has to create the new and efficient framework empowering RRF to develop PV industry in Europe, as previously the EU relied on a consumer role of importing it. While during the last 5 years 70% of the world's solar panels and components was manufactured in China, it is clear, and evidence proved that for the coming 5 years China is further determined to continue this manufacturing dominance. While the current elements of the 14th Plan of China for the next 5 years do not lay out a clear roadmap to rapidly decarbonise China's economy, boosting supply chain resilience and innovation in clean economy sectors remain priority areas in Beijing's plans.² The EU Green Deal targets will not achieve its planned potential if the current PV industry issues and challenges will not be addressed appropriately. The lessons learned should be taken into account as in 2009 the government's spending in economies across the world represented a unique opportunity for green industries. At that time the EU devoted for green investment 16,4 billion euros, without prioritizing PV manufacturing, while China at the same year devoted 147 billion euros, largely for PV manufacturing.³

Based on the current market situation there is an excellent window of opportunity of 2–4 years for Europe to build a competitive PV manufacturing value chain in terms of both, scale and technology, because of a technological shift. The global PV industry needs to invest in new production equipment and build new factories to move into the next generation of silicon solar cell technology with higher efficiencies, such as TOPCO, Interdigitated Back Contact ZEBRA (IBC-ZEBRA), and heterojunction technology (HTJ), and in the next step tandem cells (were upcoming technologies such as Perovskites show great potential). The large Chinese manufacturers will probably not go for this shift in the very near future, as they have invested during the last few years into upgrading their factories in a multi-Gigawatt scale for the second generation (PERC) of solar cells.

Member States are struggling to achieve ambitious RES targets. **The RRF will be instrumental to finance this transformation, while the national RRFs will be integral to plan and organise the transformation.** National RRFs should include not only measures and actions to achieve RES targets, but also to undertake the concentrated efforts for PV manufacturing development in Europe. Without this, European manufacturing will lose the chance to be competitive during the following decades, and Europe may not achieve its industrialisation and job creation ambitions.

Both existing and new stimulus packages must comprise dedicated urgent lines for PV development, including manufacturing. The RRF is essential and instrumental to achieve Green Deal targets. To ensure high local content and added value, massive investments in green energy production should be preceded by an adequate increase of EU-based equipment manufacturing. **It should be clearly stated and practically implemented that the RRF is the key instrument to achieve the needed policy, competitiveness and sustainable growth objectives for the PV industry in Europe.** Until about 2015 almost all production equipment was designed, manufactured and delivered by European companies. Since China invested heavily in their local machine builder's industry (to copy foreign equipment) and preferred local sources in new plants, most foreign equipment providers lost their share and already

² China's 14th Five Year Plan: A Contender for the European Green Deal, Byford Tsang, E3G Briefing Paper, April, 2021, page 15.

³ http://ig-legacy.ft.com/content/cc207678-0738-11de-9294-000077b07658?nclick_check=1 17 August, 2009.

many of them gave up. But European equipment manufacturers still can be in front for the new technologies and can provide competitive equipment (e.g. Industry 4.0, AI-technologies) if the present investment window will be used as described in this proposal.

The competitive advantage of European PV manufacturing could be developed by the special attention to Building Integrated Photovoltaics (BIPV), which could ensure the synergy of the large-scale PV installations penetration and implementation of European Commission's renovation wave objectives together with the Member States efforts on national long-term renovation strategies. As BIPV opens completely new and large-scale potential for the production of the PV, European PV manufacturing companies could benefit not only from the scale of the production, but also from the specific quality requirements as the renovation is more demanding for the individual solutions than the traditional PV electricity generation.

Currently, the EU has developed ambitious EU Green Deal objectives, but the specific wide-scale EU strategy on solar power deployment is still not comprehensively addressed. Accordingly, RRF support for the development of PV manufacturing in Europe could be both — a financial instrument to boost ongoing solar PV development demand and also a long-term strategy to develop EU value chains as a part of the Green Deal implementation.

2. PV MANUFACTURING — A CRITICAL VALUE CHAIN

The IEA confirmed in its World Energy Outlook 2020 that PV is expected to become the most cost-effective energy source, declaring solar PV to become the “new king of electricity production”. As a consequence, **the global PV installations are expected to grow at least ten times from 2020 to 2040**, which will increase the produced electricity from PV from 664 TWh to more than 8 000 TWh or even more, depending on the scenarios to be followed⁴. **Forecasts shows that in the EU the PV annual installations could double in 2-3 years — according to a High scenario reaching 40-45 GW annual installations in 2023-2024, creating in total 290 GW installed capacity by 2024.**⁵ Such growth within the EU and outside the EU should be reflected adequately by RRP policies of the EU Member States, and RRF planning and monitoring by the European Commission.

During the first years of the global PV market development, the US and Europe held a large share of global production of PV cells and modules. With time, other parts of the world, with China in the lead, started to gain larger market shares first in terms of manufacturing volumes and then also in terms of installations. **At the end of 2020 the EU was the second largest market in terms of cumulative capacity after China**, and a preliminary estimation from IEA PVPS is that **20.6 GW of PV capacity was installed in Europe in 2020**, as shown in *Figure 1*. Thus, **the EU installed about 15% of the estimated global PV market installations of 134 GW in 2020.**

However, in the same year **Europe only produced 11% of the PV silicon in the world. With regards to ingot and wafers, the number is about 1%. The situation for cells is really damaging, with only 0.4% of the total global production, while the European share of the module production is about 4%. The only part of the value chain where Europe as a continent produces more than what is being installed internally is probably inverters, with about 25% of the world production.** The current situation is consequently that Europe is heavily dependent on imports of key components for its domestic PV market. The energy transformation promises Europe to leave the current energy dependence, where we needed to import fossil fuels for our energy consumption. However, **we are instead about to enter a new type of energy dependency, of importing the necessary components for the renewable energy installations.** ESMC strongly advocates for the EU to avoid such a critical dependency!

⁴ IEA World Energy Outlook 2020, <https://www.iea.org/reports/world-energy-outlook-2020>

⁵ EU Market Outlook for Solar Power, 2020-2024, SolarPower Europe, 2020, [EU Market Outlook for Solar Power, 2020-2024 – SolarPower Europe](#)

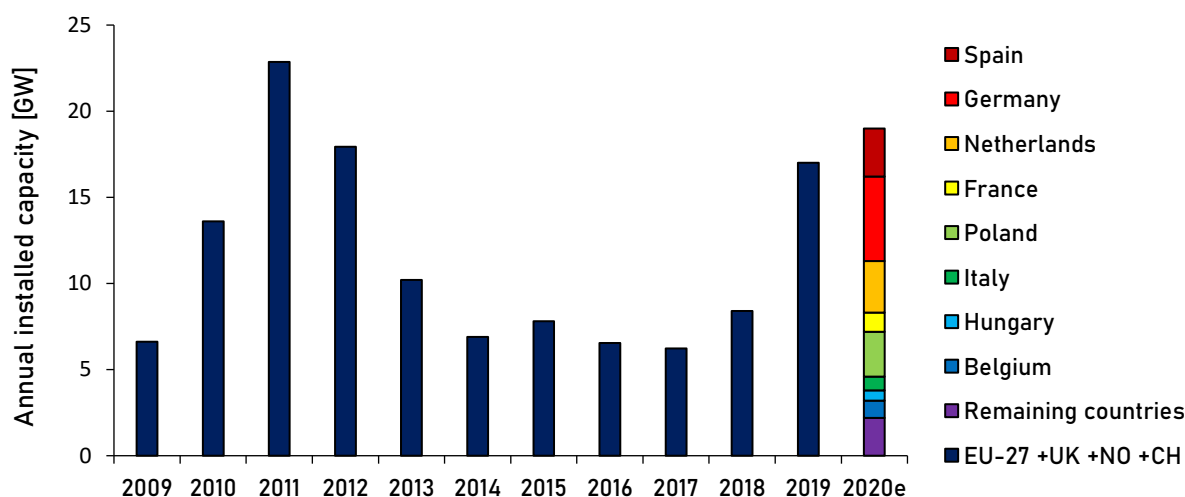


Figure 1. Evolution of annual PV Installations in Europe (Source: IEA PVPS).

ESMC believes that 75% target of the European PV installations should be manufactured in Europe is eligible, and at the same time about two-thirds of the European production exported, creates a reasonable European manufacturing capacity of about 60 GW by 2026 – this is the ESMC targeted goal.

The USA is in a similar situation to Europe, with very little PV manufacturing left. However, also the USA in particular with the new administration is starting to realize the strategic importance of PV and is planning to put in place incentives not just for a massive roll out of PV, but also to build up manufacturing capacities.

ESMC have analysed the global trade flows of solar cells and modules.⁶ In total, Europe as a continent imported solar cells and modules to a value of 10 472 M\$⁷ from the rest of the world in 2019 (68% from China), while only exporting 1 565 M\$ in the same year. **The net export/import balance of PV cells and modules to Europe was consequently about -8.9 billion US-dollars or approx. 7.4 billion euros in 2019.** This number has been increasing each year, as *table 1* shows, and is expected to continue to increase if the European community fails to address the situation and to push to strengthen the upstream PV value chain in Europe. Value creation and jobs should be brought back to Europe.

Table 1. The total value of traded *Photosensitive semi-conductor devices, including photovoltaic cells whether assembled in modules or made up into panels; Light emitting diodes* with European countries from 2016 to the third quarter of 2020. All data is presented in thousands of US\$ and collected from ITC data base Trademap.

	2016 [M\$]	2017 [M\$]	2018 [M\$]	2019 [M\$]	Q1-Q3 2020 [M\$]
Import	6 331	6 484	8 127	10 472	7 730
Export	1 702	1 646	1 721	1 565	1 275
Export/Import balance	-4 629	-4 839	-6 406	-8 907	-6 455

The European Commission's guidance to the Member States for the RRP includes the statement that *"Member States are invited to consider to what extent the relevant reforms and investments financed by the Facility will help make the Union more resilient, in particular as regards critical value chains"* and in a footnote the renewables energy technology is regarded as such a critical value chain.

Even if it is small and only contributes to a fraction of the European demand for PV installations, the European industry covers the whole PV value chain. It includes a world-class polysilicon producer, currently looking for ways to reduce its CO2 emissions. Wafer manufacturing is done at a 1 GW-scale fabrication plant based on hydropower and with plans for expansion. Cell manufacturers are small, but they are working with innovative technologies resulting in higher efficiencies compared to

⁶ The Harmonized System (HS) code 854140; *Photosensitive semi-conductor devices, including photovoltaic cells whether or not assembled in modules or made up into panels; Light emitting diodes.*

⁷ A value conversion from the countries' national currencies has already been done by the national trade ministries as all data is reported in US\$ in the ITC data base. Even though it would be logical to use Euros (€) when discussing the trade flows for Europe, a choice of not re-converting the data has been made to secure the accuracy of the reported amounts, as information on time of conversion and conversion rates are unknown.

mainstream technologies, thus with a higher energy output per unit area. Tandem structures, which are being evaluated in R&D centres, show promising results. This technology would greatly boost the efficiency of the cells. Then, even if module manufacturers in the GW-scale are currently not in place in Europe, there are plenty of small to medium-size companies assembling modules. They employ innovative technologies to reduce the cell-to-module losses, for example by using conductive back sheets, smart-wire interconnection technology, or even manufacturing modules with the lowest CO2 emissions in the world. Some companies focus on specific products like back sheets, and glass coatings to improve the reflective properties of the modules, trackers for bifacial applications, inverters, cooling frames, among others.

However, **in the view of ESMC the importance of bringing back and strengthening PV manufacturing in Europe is not stressed enough in the European Commission's guidance to the Member States, nor is it reflected in the draft national RRFs that we have seen so far.** As demonstrated with the numbers above, **the European Union is heavily dependent on importing components for PV installations.** As PV is considered the most import tool for tackling climate change, this import dependency **could threaten the whole European energy transformation** if the east Asian import streams would become limited or blocked for either political, economic, or other reasons.

3. A TECHNOLOGY-INDUCED WINDOW OF OPPORTUNITY FOR EUROPE

Europe still has leading positions in PV technology innovation, but this can only remain if an industrial manufacturing base exists. The traditional Aluminium Back-Surface-Field technology of solar cells (Al-BSF) with 18–22% energy conversion efficiency is currently globally being replaced by the Passivated Emitter and Rear Contact (PERC) technology and its variants. This allows for higher efficiencies of 20–24%, with only moderate costs for upgrading the production lines.

The next step to third-generation high-efficiency PV cells will allow even higher efficiencies of 23–26%, based on heterojunction (HJT) or TOPCON technologies. These can be produced today at similar cost to PERC cells, in the 20–30 ct/W_p price range, resulting in competitive or even lower levelized cost of electricity (LCOE) of PV electricity, due to the higher efficiencies of more costly premium modules. An IBC ZEBRA cell technology, which is currently being ramped up by the European companies and research institutes not only allows to reach efficiency above 23%, but also allows for solar energy to enter high added value specific markets like Building Integrated Photovoltaics (BIPV), Vehicle Integrated Photovoltaics (VIPV) and space applications.

The Asian PV manufacturers have invested heavily into upgrading their production facilities to be able to produce PERC cells in the last years. The existing large-scale GW factories in Asia cannot be upgraded to the HJT or TOPCON technologies without large efforts. Instead, entirely new factory systems need to be built. **This can effectively give Europe a head start, as the existing Asian GW factories restructured for the PERC technology must be amortised before the Chinese manufacturers can and will be willing to make new major investments into the third generation of PV cells.**

This technology change and current market situation induces a window of opportunity for Europe may only be 2–4 years long (possibly 5 at the most), such that time is of the essence. Europe has the chance to build a lasting competitive advantage, through a bold scale up, that will ensure lasting competitiveness in both scale and technology.

Directing RRF funds towards this scale up of latest generation-cell and module manufacturing would give Europe a chance to grab this window of opportunity and allow us to get ahead of the Chinese manufacturers once again.

4. PAY-BACK TIME OF THE REQUESTED SUPPORT

ESMC estimated the share of the economic value created by the installed PV capacity in Europe that is captured locally for all cost items. It was assumed that 100% of downstream value items are captured locally, i.e. within the EU, while the share of upstream value items (i.e. materials and components of the system) captured locally was quantified using as a proxy the estimated capacity produced in the EU. Assumptions were made for all 3 situations (2020, 2025 “BAU”, 2025 “Political Engagement”). For the 2025 “Political Engagement” scenario, an average 75% share of the PV capacity installed in the EU was considered to be based on modules produced in the EU (16% in the “Business as Usual” scenario),

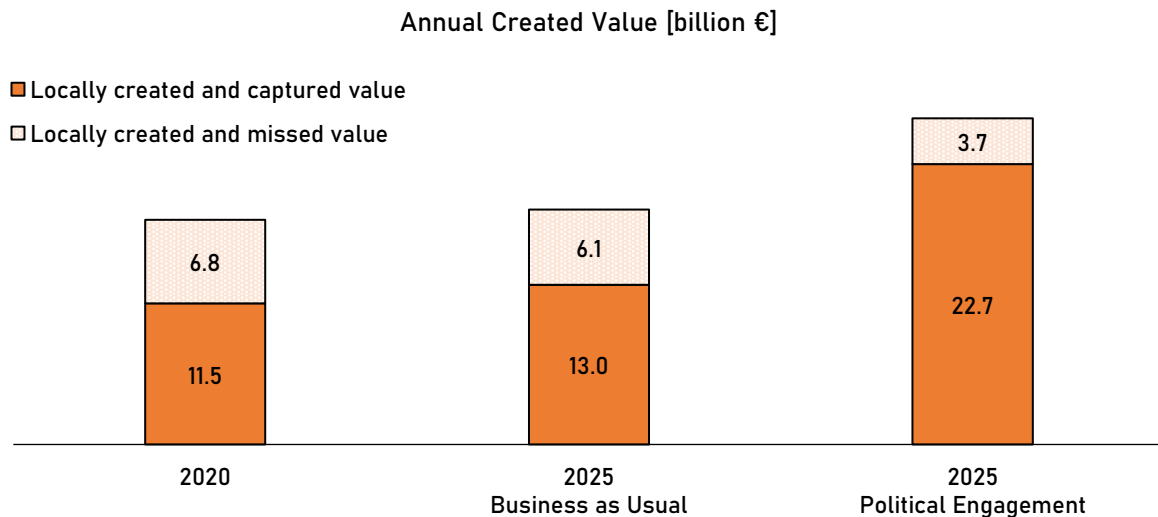


Figure 2. Yearly economic value of PV installations in the European Union, plus Norway, UK and Switzerland (Analysis by Becquerel Institute).

supposedly achieved thanks to the political support provided to the PV industry. Regarding the rest of the components, it is assumed in the 2025 “Political Engagement” scenario that 66% of the balance of system is manufactured in the EU, while this percentage only stands at 50% in the 2025 “Business-as-usual” scenario.

Thus, the results in *Figure 2* show the total economic value created thanks to the PV capacity installed in Europe. This total value is split between the value captured locally in the EU and the “missed” value, that is the economic value generated outside of the EU by the PV installations performed in the EU. The graph shows the increase of the total economic value created annually between 2020 and 2025, and a higher increase of this value in the “Political Engagement” scenario compared to “Business-as-usual”. This higher increase is linked to the augmented annual PV market favoured by appropriate policies. In addition, the graph also highlights the missed value that can be regained from relocating upstream industrial activities in the EU. **In total, around 10 billion euros are additionally captured in the EU in a single year through the “Political Engagement” scenario in 2025, compared to the “Business-as-usual” scenario, i.e. a 75% increase of the captured value.** At the same time, the missed economic value is almost divided by a factor of two.

Consequently, this ESMC analysis shows that **a local value of about 50 billion euros in total would be captured in Europe under the RRF time frame till 2026** if the EU would create a better framework for PV manufacturing. Subsequently, **ESMCs request for 3% of the total RRF budget (which corresponds to 20 billion euros) for support to the European manufacturing value chain would be paid of already within the RRF period, with an additional value creation of about 30 billion euros.** In addition, after 2026 the European PV manufacturing industry would continue to create jobs and capture the value created by the installations of PV systems locally in Europe as well as lowering the energy import dependency of the continent.

5. SPILL-OVER TO JOBS

The support for the energy transformation depends on the public acceptance of the measures and developments. PV doesn't escape this reality and well-paid jobs are part of the winning solution to public acceptance of the energy transformation. This comprises installations, but also industrial jobs and R&D&I jobs.

Reaching 75% penetration of European manufactured modules of the total market in Europe by 2025, and moving beyond this, will create horizontal positive effects for the EU economy. This is dependent on PV manufacturing being secured in Europe to the extent to at least balance out the current export-import imbalance.

In addition to the analysis of local captured values, ESMC has conducted a job creation estimate. The number of jobs associated to the PV sector are estimated based on two factors: the annual installed capacity and the share of this capacity produced locally. Specific labour intensities are considered for the different parts of the value chain and regions. For the 2025 "Political Engagement" scenario, an average 75% of the capacity installed in the EU was expected to be produced locally, supposedly achieved thanks to the political measures supporting the PV industry.

The results on the charts below show, on the left part of the *figure 3*, the number of total annual full-time jobs (i.e. direct and indirect, downstream as well as upstream) that can be associated to PV installations in Europe. It permits to quantify the impact of favouring a local production, through the comparison of the 2025 "Political Engagement" scenario to the "Business as usual" scenario. **Around 178 000 additional jobs would be created in Europe in case policies backing up the local PV value chain would be enacted.** Even more markedly, the right part of the figure specifically focuses on the upstream sector, i.e. manufacturing and R&D, and shows an **impressive 900% increase of the number of upstream jobs in the 2025 "Political Engagement" scenario** compared to the "Business as usual" scenario.

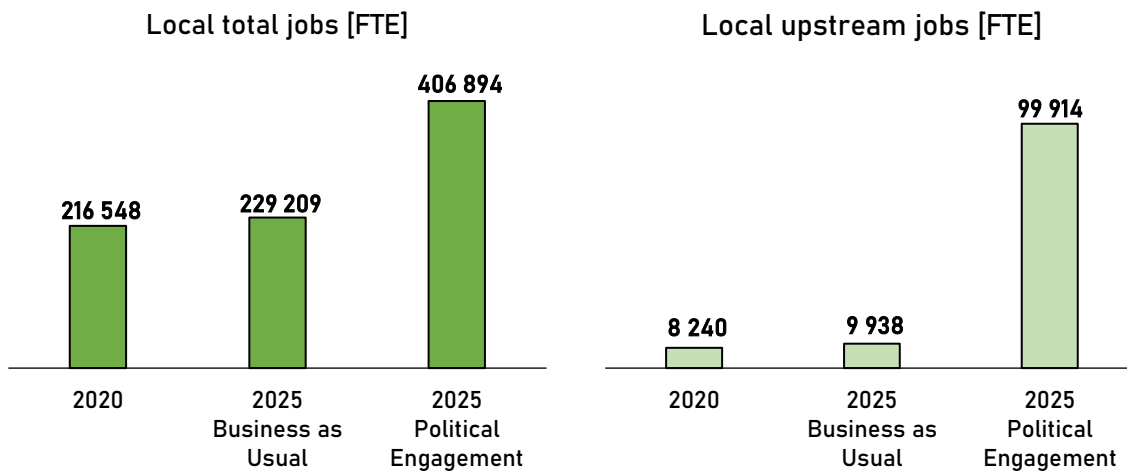


Figure 3. Number of estimated full-time employees (FTE) in the European PV sector. Analysis done by ESMC.

Finally, it must be emphasized that the results above are estimated for quite conservative projections of the PV annual installed capacity in 2025. The impact on the EU economy of relocating PV industry within the Union will be tremendous when the PV market will increase by a 10-fold factor, which is necessary to reach our climate goals. Furthermore, **besides the numbers themselves, the qualitative aspects of the created jobs need to be considered, as highly qualified industrial jobs will be created.** One last element to be noted is that this study also only considers the EU PV market. Export of EU manufactured PV products could increase the economic value generated in the EU thanks to solar PV even more.

III. STANDARD EXAMPLE TO MEMBER STATES: PV MANUFACTURING IN NATIONAL RRP

Member States plan ambitious RRP, where solar does not only constitute an important part of RES, but also where the growth of RES is heavily linked to the tremendous augmentation of solar energy production in Europe. Some Member States plan 100% renewable electricity production already in 2030, meaning the PV installations also should cover a considerable part of the electricity generation.

Most of the financing plans in the Member States RRP are directed towards scaling up the PV installations and consequently increasing the solar generation share in their respective national energy mixes. The fact that PV manufacturing currently is not duly represented in the national RRP is alarming – the perfect momentum could be lost, leading to the unused PV manufacturing potential in the EU. Not even the Member States that already included PV manufacturing dimension in their national RRP, or those that strengthened this industrial component after the public consultations, approached PV manufacturing as the separate component in their corresponding RRP.

Evaluating the strategic, economic, and social importance of PV manufacturing for Europe and seeking better representation of this asset in Member States national RRP, **ESMC is presenting a standard example recommendation to Member States to include PV manufacturing industry in the national RRP (Table 2).** This example could be the reference point for Member States to maximize the benefits of RRF for PV manufacturing.

Table 2. Standard example recommendation to Member States to include PV industry in their national RRP

EU flagship	Power up
Component	PV industry development and stimulation to increase the manufacturing of local components
1. Description of the component	<p>In the energy policy, climate policy and industrial policy domain the objectives of this component are the following:</p> <ol style="list-style-type: none"> 1) Jobs and growth 2) Industry development 3) Green transition <p>Examples of reforms and/or investments:</p> <p><i>Reforms:</i></p> <ul style="list-style-type: none"> • Adapting structural reforms to integrate national PV installation targets with PV manufacturing added-value indicators. • Accelerating the establishment of a PV manufacturing industry (tax incentives, land acquisition) within a 2-4 years' timeframe. <p><i>Investments:</i></p> <ul style="list-style-type: none"> • Ensuring grants availability for PV manufacturing projects. • Securing credit guarantees and loans for the companies establishing or expanding the manufacturing of PV components. • Creating consistent and measurable evaluation criteria for the investments in the projects. <p>Estimated cost of the component: EUR XX million, of which EUR XX million (X%) are covered by RFF.</p>

<p>2. Main challenges and objectives</p>	<p>a) Main challenges</p> <ul style="list-style-type: none"> • EU and Member States are heavily dependent on importing components for PV installations. • Member States' individual and joint efforts using national instruments and RRF to increase annual PV installations will deepen the gap between EU PV installations and PV manufacturing. • Up to 2026 the planned national PV installations will grow to X GW, in PV components import scenario resulting X million euros financial flow from the country, mostly – to third countries. • Due to unused jobs and growth potential, the losses could reach X million euros. <p>b) Objectives</p> <p>In line with the European Flagship 'Power Up', the objectives of the PV industry development and stimulation component are the following:</p> <ol style="list-style-type: none"> 1) Jobs and growth – X jobs created, and X million euros budget revenues raised. 2) Industry development – new industrial sectors developed with the positive side effect for the existing sectors (assembling, logistics and transport). 3) Green transition – additional impact for RES electricity generation.
<p>3. Summary description of the reforms and investments of the component</p>	<p>a) Examples of reform</p> <ul style="list-style-type: none"> • Adapting structural reforms to integrate national PV installation targets with PV manufacturing added-value indicators. Structural reform programs should be included in energy and industry parts of the RRFs to address PV manufacturing industry issues in an integrated and comprehensive way. • Accelerating the establishment of PV manufacturing industry (tax incentives, land acquisition) within 2-4 years' time frame. Horizontal measures should be applied with clear quantitative targets of companies established to ensure PV manufacturing industry development within the special economic zones or special sectorial regulation in the Member State. <p>b) Examples of investment</p> <ul style="list-style-type: none"> • Ensuring grants and dedicated financial funds availability for PV manufacturing projects. As the grants for PV manufacturing are subject to the EU state aid rules, planning of grants should be within the presumption that PV manufacturing will be included into Important Projects of Common European Interest (IPCEI) while dedicated financial funds could be comparatively flexibly managed on national level. • Securing credit guarantees and loans for the companies establishing or expanding the production of PV components. The concrete amounts and priority sub-sectors should be identified as this is the key short-term instrument to support the development of the PV industry.

	<ul style="list-style-type: none"> • Creating consistent and measurable evaluation criteria for the investments in the projects: <ul style="list-style-type: none"> • Lowering of the carbon footprint in the technology supply chain, • Increasing the use of European technological innovations in end products and production lines, • Increasing the local (European) content measured by the added value and value shared of the suppliers.
4. Green and digital dimensions of the component	<p>a) Green transition</p> <p>Building and integrating additional renewable generation capacity is the cornerstone of the Green Deal, and the expansion of the PV components production will naturally drive this transition further as the cost and supply delivery conditions of these components will be improved.</p> <p>By comprising X% of climate expenditures, this component contributes to the 37% climate mainstreaming target.</p> <p>b) Digital transition</p> <p>Digitalization according to industry 4.0 standards will be one of the integral parts of the PV manufacturing industry, as the production, logistics and deployment of PV components are directly connected with the application of digital and AI solutions, also leading to higher competitiveness for the end products.</p> <p>By comprising X% of digital expenditures, this component contributes to the abovementioned digital target of 20%</p>
5. Milestones, targets, and timeline	Subject to Member State decisions in relation to identified reforms and investments.
6. Financing and costs	Subject to Member State decisions.