

To: Ministry of Energy of the Republic of Lithuania
Ministry of the Economy and Innovation of the Republic of Lithuania

Copy: Office of the Government of the Republic of Lithuania

10 November, 2021

Invitation to join Important Project of Common European Interest framework for the solar PV manufacturing industry in Europe

We are pleased to invite you as the Governmental stakeholder to a discussion and decisive actions for the strategic perspectives of the solar photovoltaics (PV) manufacturing industry in Europe.

On behalf of the European PV manufacturing industry, we want to alert the stakeholders on the critical timing and on the need to strengthen the European PV value chains. In February 2021, a European Solar Initiative was launched together with the Commissioner for Internal Market Thierry Breton and the Commissioner for Energy Simson, setting the strategic objective of redeveloping 20 GW of solar PV manufacturing capacity in Europe by 2025 and along the full value chain. In that framework, this year in July an Important Project of Common European Interest (IPCEI) for PV manufacturing was initiated led by the European Solar Manufacturing Council (ESMC) and gathering the European PV industrial actors. Projects from across the value chain will meet the urgent demand for renewable energy technology development as well as manufacturing capacities and will play an important role for the competitiveness of the entire European PV industry.


The integration of the whole PV value chain is already reflected by the active and direct involvement in this IPCEI initiative of 40 companies and institutions from Austria, Belgium, Finland, France, Germany, Italy, Lithuania, Netherlands, Norway, Poland, Spain, Sweden, Switzerland and United Kingdom: *3S Solar Plus, AGC, Applied Materials, Coveme, ENEA, Enel Green Power, EURAC Research, Evolar, Fraunhofer ISE, Futurasun, Giga PV, H2GEMINI Technologies, IFE, Imec, INES, Institute for Renewable Energy, IPVF, KGHM, LuxChemtech, MCPV, Metsolar, Mondragon Assembly, Norsun, Oxford PV, EDF ENR PWT (Photowatt), Protech, REC Solar Norway, Singulus Technologies, Sintef, Smart Energy DIH, Solarge, Solean, Solitek, Standex Italia, Ulbrich, Valoe, Vitronic, VOLTEC Solar, VON ARDENNE, ZS-Handling.*

The European PV manufacturing industry is kindly inviting Lithuania to join the process by confirming your initial support for the PV IPCEI initiative. The receipt of your confirmation during November 2021 would be highly appreciated. Member States expressing their support earlier will have a time and policy framing advantage in the PV IPCEI framework as the number of the initiated projects could be expanded. Your support confirmation will constitute a key benefit for the actively involved companies, as well as for the entire European PV manufacturing industry and its future competitiveness. Following your

confirmed support, a joint work programme for the PV IPCEI will be launched in close cooperation with the European Commission, and in line with the IPCEI legislative requirements and your individual expectations, focused on State Aid support for projects approved under the PV IPCEI.

We, Soli Tek Cells UAB, Valoe Cells UAB, Metsolar UAB, Public Institution *Applied Research Institute for Prospective Technologies* and Public Institution *Smart Energy DIH* are participating in this IPCEI initiative and striving for the adequate, timely and complete support for the PV industry in Europe. Your initial support and further actions in developing the PV IPCEI would benefit the interest of our industrial strategy and the key expectations of European citizens for the Green Deal to ensure economic growth, jobs and sustainable competitiveness.

Sincerely,




Julius Sakalauskas,
CEO, UAB "Soli Tek Cells"

Julius Denafas,
Director, UAB "Valoe Cells"

Dainius Horbačas,
CEO, UAB "Metsolar"



Lina Kygienė,
Director, Public Institution *Applied Research Institute for Prospective Technologies*



Romualdas Petraitis,
CEO, Public Institution *Smart Energy DIH*

ANNEXES:

- I) Background information on PV IPCEI;
- II) Important Project of Common European Interest – Benefits for the Participants.

I) Background information on PV IPCEI

With the launch of the ambitious Green Deal targets for the European Union and its further commitments amongst the EU Member States, it is clear that the EU will have enormous opportunities to make extensive reforms in the green industry landscape. It is, however, of critical importance to not harm the European citizens and European industry when making these changes, which makes the timing of essence.

The recent increase in PV deployment in Europe brings enormous challenges. In 2020, new wind power installations in the EU accounted for 14.7 GW, and new solar PV installations reached 20.6 GW in additional installed capacity. According to short term forecasts, the annual solar PV installations in Europe will double very soon – reaching 40-45 GW already in 2023-2024.¹ However, the current PV manufacturing capacities in the EU are critically low, representing only 0.4% of global cell and 4% of global module production.

The existing and forecasted gap between PV demand in Europe and PV manufacturing capacities will put the EU and the European countries into a new type of energy dependency, by importing large quantities of the critical hardware for the green transition. The current logistical challenges and sky-rocketing price increases of the PV modules from Asian countries clearly demonstrates the critical need for the EU to take comprehensive actions without delay to safeguard both the achievement of the ambitious Green Deal targets and the sustainably competitive European PV manufacturing industry.

A vital PV industry, and in particular a PV manufacturing industry, is one of the practical measures to ensure the strategic autonomy of Europe in times of high uncertainty of raw material supply and global logistical challenges. The urgency of the situation has been demonstrated in multiple technological sectors in the past years. Various opportunities are emerging, which are instrumental for achieving the Green Deal objectives, including but not limiting to NextGenerationEU, the Recovery and Resilience Facility, the Just Transition Fund, and European policy advancements through “Fit for 55” climate package. However, the sustainable competitiveness of the European PV manufacturing could be ensured only by innovative PV manufacturing and its full commercial deployment. IPCEI could be one of the key support instruments to bring necessary financing and addressing the considerable technological and financial risks for the European companies to achieve a breakthrough in high-efficiency PV cells production and other innovations in the whole PV manufacturing value chain.

At EU level, the renewable energy industry has been identified as one of the fourteen key industrial ecosystems to the European Union. In the updated Industrial Strategy published in May 2021, the European Commission has highlighted “the importance of regaining and strengthening EU’s competitive edge in the solar photovoltaic industry” and of “building a sizeable EU PV manufacturing industry”. The European PV industry took necessary actions with the dedicated vision to put the European PV innovations and the whole value chain into IPCEI framework. In February 2021, a European Solar Initiative was launched together with the Commissioner for Internal Market Thierry Breton and the Commissioner for Energy Kadri Simson, upon the initiative of SolarPower Europe and EIT InnoEnergy replicating the blueprint of the Battery Alliance. In July 2021, the process for an PV IPCEI was initiated and until now the governance and operational structure of the initiative has been framed including proposed 5 concrete PV IPCEI projects which now are under cooperative development. The European Commission Communication on IPCEIs are now under revision with the foreseen entering into force from January 2022.






The essence of the IPCEI is to ensure the appropriate and adequate support for the respective projects, through the participation and further commitment of the Member States under the IPCEI granting conditions, supervised and operated by the European Commission.

¹ EU Market Outlook for Solar Power, 2020-2024, <https://www.solarpowereurope.org/european-market-outlook-for-solar-power-2020-2024/>

The European PV industry companies and research institutions are cooperating and expanding the scope of innovations to be potentially developed within the PV IPCEI framework. Initially 5 projects are proposed while the new projects could also be included under the initiative of the PV IPCEI framework participants. It is expected to frame the PV IPCEI projects including the initial support of the Member States till the end of 2021.

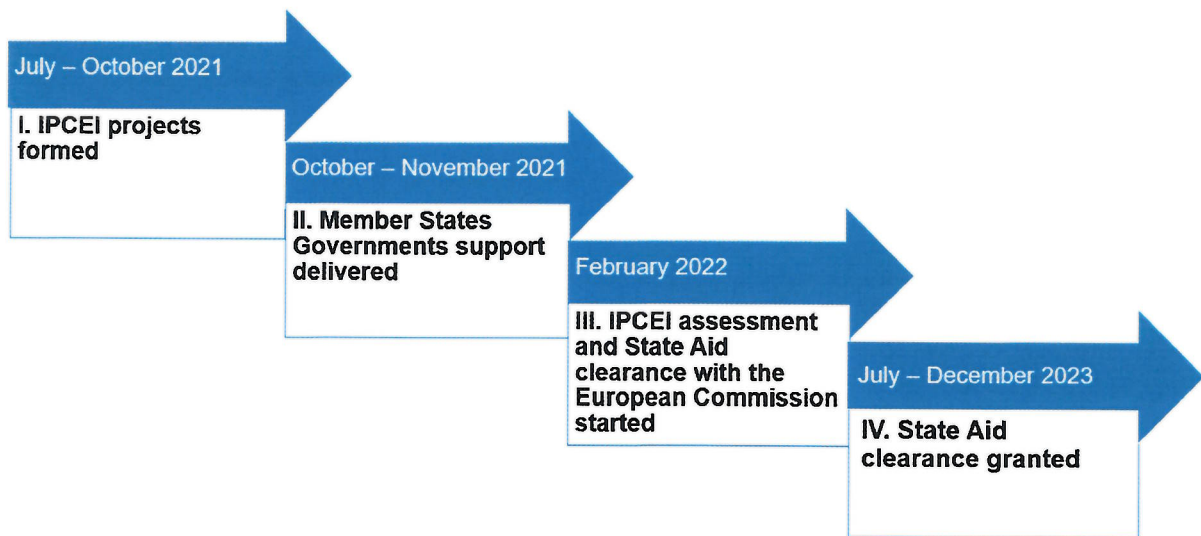
Currently, these 5 projects initiated under the PV IPCEI framework includes the following PV manufacturing innovations:

No.	Project title	Goals of the project
1.	Industrializing Heterojunction Cell and Module Technology to the Gigawatt Scale while manufacturing high performance Heterojunction solar cells	Establish within the next 7 years, 15 Gigawatt (GW) of PV cell and module manufacturing in Europe, on the basis of the highly efficient Heterojunction Technology (HJT). The first stage of the project will be the implementation of innovative HJT PV cell and module manufacturing pilot lines during 2022.
2.	Manufacturing of TOPCon PV cells and silver paste with optimised silver contacts	Extend the European PV value chain by local manufacturing of silver paste and novel PV cells. The innovation will focus on reduction of cost of silver contacts on silicon TOPCon cells, without compromising the advantages of the technology.
3.	Industrializing Tandem PV technology to the Gigawatt scale	To bring Tandem Silicon-Perovskite PV technology at industrial maturity and Gigawatt scale production establishing a production of 3 GW of PV cells and modules in Europe. Tandem technology will allow to overcome Silicon cell power efficiency conversion exceeding 30% and to lower Levelized Cost of Energy.
4.	PV integrated solutions for buildings, infrastructure and various applications	Develop and establish large-scale Europe based production of innovative integrated PV solutions. For applications in buildings (BIPV), infrastructure (IIPV), vehicles (VIPV) and agriculture (Agro-PV).
5.	Circular PV production	To ensure that PV would be the best-in-class of environmental technologies on sustainability by minimizing the environmental impact from PV manufacturing and end-of-life.

No.	Project title	Confirmed partners
1.	Industrializing heterojunction cell and module technology to the Gigawatt scale	
2.	Manufacturing of TOPCon PV cells and silver paste	
3.	Industrializing Tandem PV technology to the Gigawatt scale	
4.	PV integrated solutions	
5.	Circular PV production	

The PV IPCEI framework has been initiated and started to be established in July 2021. Although the IPCEI process is rather complex the following vision has been confirmed to finalize the State aid procedures in 2023. Close cooperation among the PV IPCEI partners and participating Member States and their early involvement in the process is one of the key factors for the successful confirmation of the IPCEI status for PV industry and the implementation of the foreseen projects. The proposed projects are being formed currently – accordingly there are all the possibilities to include the new projects or adapt the ongoing projects in line with the views of joining Member States and partners.

Planned PV IPCEI schedule (2021 – 2023)



II) IMPORTANT PROJECT OF COMMON EUROPEAN INTEREST – BENEFITS FOR THE PARTICIPANTS

Background: The EU IPCEI process is dedicated to promoting innovative industrial deployment by allowing circumventions of state aid regulations and thereby permitting private-public joint financing. The IPCEI mechanisms permits EU Member States to support transnational projects of strategic significance. These highly innovative projects should contribute to economic growth, jobs and competitiveness. EU State Aid rules makes an exemption for such activities under the framework of IPCEI, but it still requires the approval of the European Commission. The evaluation is being made mainly on individual projects, but the approval is made for the package of the projects. Any IPCEI project should prove the existing considerable technological or financial risks for the deployment of the innovation and how this will benefit the companies.

I. WHY AN IPCEI FOR PV MANUFACTURING IS CRITICALLY IMPORTANT?

- Any of the financial support dedicated for PV manufacturing should be approved by the European Commission. **IPCEI could be one of the support instruments to bring necessary financing for the European companies to innovation** to make a breakthrough in high-efficiency PV cell production and other innovations in the PV manufacturing value chain.
- **IPCEI could directly** (through approval of the framework and financing) **or indirectly** (discussing and completion of the necessary procedures automatically triggers political attention to the issues of PV manufacturing in Europe) **impact the policy framework for PV manufacturing on the national and EU level, which further could be transferred to other attractive funding instruments**, such as the Recovery and Resilience Facility, the Just Transition Fund, EU State Aid Guidelines, or General Block Exemption Regulation.

II. WHAT ARE THE CONCRETE BENEFITS FOR THE COMPANIES PARTICIPATING IN IPCEI?

- **Safeguarded commitment of the Member States on financing.** During the notification process, Member States should commit to certain concrete levels of financial support, to be dedicated to the specific IPCEI topic and to concrete projects within the Member State.
- **Better conditions for PV innovation industry development and launch of concrete innovation within the company with high technological or financial risks.** In case of a positive proof of the ambitious targets for Research, Development, Innovation, and First Industrial Deployment, companies could benefit from direct financial support up to 100% of a financing gap.
- **For companies joining the IPCEI framework early, the chances are better for individual approval and easier coordination during the process.** For Member States or companies that are joining later to the already launched IPCEI, there is a need to prove additionality. Accordingly, the European Commission recommends joining IPCEI initiative at the beginning.

III. WHY THE IPCEI ON PV INNOVATION AND MANUFACTURING IS MORE REALISTIC NOW THAN EVER BEFORE?

- **The European Commission is currently reviewing the IPCEI guidelines** with a targeted vision to (a) simplify the rules of IPCEI adoption, (b) to expand its applicability to small and medium-sized enterprises and (c) to enhance IPCEI consistency with EU policies, enabling green and digital transformation.
- **The newly updated European Industrial Strategy explicitly supports IPCEIs** with the target to pool public resources in areas where the market alone cannot deliver breakthrough innovation. Additional IPCEIs under current discussion are next-generation cloud, hydrogen, low-carbon industry, pharmaceuticals, and a second IPCEI on semi-conductor microelectronics. IPCEI framework for the PV has been initiated with the purpose to include PV innovation and manufacturing to this list.

IV. CAN SMALL COMPANIES WITH LIMITED BUDGET BE PART OF AN IPCEI?

- **The European Commission is not limiting, but rather promoting the participation of small companies or Small and Medium Enterprises (SMEs) to participate in IPCEI.** The participation of small companies or entities could even maximize the chances of the PV manufacturing to be approved the status of IPCEI. According to the current European Commission *criteria for the analysis of the*

compatibility with the internal market of State aid to promote the execution of Important Projects of Common European Interest:

- European Commission will take a more favourable approach where the project involves important collaborative interactions in terms of number of partners, involvement of organisations of different sectors, or the involvement of undertakings of different sizes.
- The Member States, after forming IPCEI and after approval of the State aid shall ensure certain transparency by the publication of the information about granted State aid on a comprehensive State aid website, at national or regional level – such requirement can be waived with respect to individual aid awards below EUR 500 000.
- In general, one of the objectives of the ongoing review of the current State aid Guidelines by the European Commission is general intention to make favourable conditions for SMEs – accordingly additional bonuses are planned to be given for SMEs in the State aid clearance process.
- **There are different forms of participation in the IPCEI for the companies**, such as direct participation, external partnerships or collaborations with the participants of the IPCEI. This ensures the participation flexibility in IPCEI for all companies or entities, including small companies and SMEs – the most appropriate participation form could be selected by the companies itself.

V. EXAMPLES OF IPCEIs:

- **Battery value chain** (2019-2031) — 7 Member States and 17 companies participating, €3.2 billion funding approved, expected an additional €5 billion in private investment. Average dedicated support is €457 million per country.
 - **EuBatIn – European Batteries Innovation** (2020-2028) — 12 Member States and 42 companies participating, €2.9 billion funding approved, expected an additional €9 billion in private investment. Average dedicated support is €242 million per country.
 - **Microelectronics** (2018-2024) — 4 Member States and 29 companies participating, €1.75 billion funding approved, expected an additional €6 billion in private investment. Average dedicated support is €438 million per country.
 - **Hydrogen** — ongoing process, decision expected at the end of 2021.
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Näringsdepartementet
Statssekreterare Johan Adamsson
Regeringskansliet
10333 Stockholm

29 oktober 2021

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We are pleased to invite you as the Governmental stakeholder to a discussion and decisive actions for the strategic perspectives of the solar photovoltaics (PV) manufacturing industry in Europe.

On behalf of the European PV manufacturing industry, we want to alert the stakeholders on the critical timing and on the need to strengthen the European PV value chains. In February 2021, a European Solar Initiative was launched together with the Commissioner for Internal Market Thierry Breton and the Commissioner for Energy Simson, setting the strategic objective of redeveloping 20 GW of solar PV manufacturing capacity in Europe by 2025 and along the full value chain. In that framework, this year in July an Important Project of Common European Interest (IPCEI) for PV manufacturing was initiated led by the European Solar Manufacturing Council (ESMC) and gathering the European PV industrial actors. Projects from across the value chain will meet the urgent demand for renewable energy technology development as well as manufacturing capacities and will play an important role for the competitiveness of the entire European PV industry.

The integration of the whole PV value chain is already reflected by the active and direct involvement in this IPCEI initiative of almost 40 companies and institutions from Austria, Belgium, Finland, France, Germany, Italy, Lithuania, Netherlands, Norway, Poland, Spain, Sweden, Switzerland and United Kingdom: *3S Solar Plus, AGC, Applied Materials, Coveme, ENEA, Enel Green Power, Evolar, Fraunhofer ISE, Futurasun, Giga PV, H2GEMINI Technologies, IFE, Imec, INES, Institute for Renewable Energy, IPVF, KGHM, LuxChemtech, MCPV, Metsolar, Mondragon Assembly, Norsun, Oxford PV, EDF ENR PWT (Photowatt), Protech, REC Solar Norway, Singulus Technologies, Sintef, Smart Energy DIH, Solarge, Solean, Solitek, Ulbrich, Valoe, Vitronic, VOLTEC Solar, VON ARDENNE, ZS-Handling.*

The European PV manufacturing industry is kindly inviting the Swedish Government to join the process by confirming your initial support for the PV IPCEI initiative. The receipt of your confirmation during November 2021 would be highly appreciated. Member States expressing their support earlier will have a time and policy framing advantage in the PV IPCEI framework as the number of the initiated projects could be expanded. Your support confirmation will constitute a key benefit for the actively involved companies, as well as for the entire European PV manufacturing industry and its future competitiveness. Following your confirmed support, a joint work programme for the PV IPCEI will be launched in close cooperation with the European Commission, and in line with the IPCEI legislative requirements and your individual expectations, focused on State Aid support for projects approved under the PV IPCEI.

Evolar AB is participating in this IPCEI initiative and striving for the adequate, timely and complete support for the PV industry in Europe. Your initial support and further actions in developing the PV IPCEI would benefit the interest of our industrial strategy and the key expectations of European citizens for the Green Deal to ensure economic growth, jobs and sustainable competitiveness.

Evolar AB



Mats Ljunggren, CEO

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A vital PV industry, and in particular a PV manufacturing industry, is one of the practical measures to ensure the strategic autonomy of Europe in times of high uncertainty of raw material supply and global logistical challenges. The urgency of the situation has been demonstrated in multiple technological sectors in the past years. Various opportunities are emerging, which are instrumental for achieving the Green Deal objectives, including but not limiting to NextGenerationEU, the Recovery and Resilience Facility, the Just Transition Fund, and European policy advancements through “Fit for 55” climate package. However, the sustainable competitiveness of the European PV manufacturing could be ensured only by innovative PV manufacturing and its full commercial deployment. IPCEI could be one of the key support instruments to bring necessary financing and addressing the considerable technological and financial risks for the European companies to achieve a breakthrough in high-efficiency PV cells production and other innovations in the whole PV manufacturing value chain.

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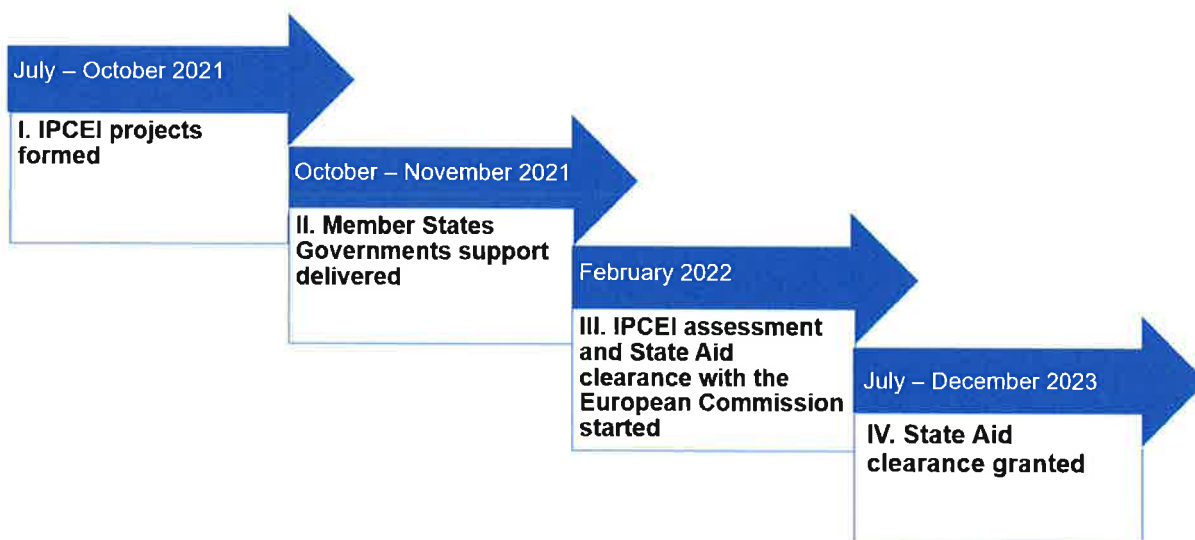
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2.	Manufacturing of TOPCon PV cells and silver paste with optimised silver contacts	Extend the European PV value chain by local manufacturing of silver paste and novel PV cells. The innovation will focus on reduction of cost of silver contacts on silicon TOPCon cells, without compromising the advantages of the technology.
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Planned PV IPCEI schedule (2021 – 2023)



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Background: The EU IPCEI process is dedicated to promoting innovative industrial deployment by allowing circumventions of state aid regulations and thereby permitting private-public joint financing. The IPCEI mechanisms permits EU Member States to support transnational projects of strategic significance. These highly innovative projects should contribute to economic growth, jobs and competitiveness. EU State Aid rules makes an exemption for such activities under the framework of IPCEI, but it still requires the approval of the European Commission. The evaluation is being made mainly on individual projects, but the approval is made for the package of the projects. Any IPCEI project should prove the existing considerable technological or financial risks for the deployment of the innovation and how this will benefit the companies.

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The integration of the whole PV value chain is already reflected by the active and direct involvement in this IPCEI initiative of 40 companies and institutions from Austria, Belgium, Finland, France, Germany, Italy, Lithuania, Netherlands, Norway, Poland, Spain, Sweden, Switzerland and United Kingdom: *3S Solar Plus, AGC, Applied Materials, Coveme, ENEA, Enel Green Power, EURAC Research, Evolar, Fraunhofer ISE, Futurasun, Giga PV, H2GEMINI Technologies, IFE, Imec, INES, Institute for Renewable Energy, IPVF, KGHM, LuxChemtech, MCPV, Metsolar, Mondragon Assembly, Norsun, Oxford PV, EDF ENR PWT (Photowatt), Protech, REC Solar Norway, Singulus Technologies, Sintef, Smart Energy DIH, Solarge, Solean, Solitek, Standex Italia, Ulbrich, Valoe, Vitronic, VOLTEC Solar, VON ARDENNE, ZS-Handling.*

The European PV manufacturing industry is kindly inviting Italy to join the process by confirming your initial support for the PV IPCEI initiative. The receipt of your confirmation during November 2021 would be highly appreciated. Member States expressing their support earlier will have a time and policy framing advantage in the PV IPCEI framework as the number of the initiated projects could be expanded. Your support confirmation will constitute a key benefit for the actively involved companies, as well as for the entire European PV manufacturing industry and its future competitiveness. Following your confirmed support, a joint work programme for the PV IPCEI will be launched in close cooperation with the European Commission, and in line with the IPCEI legislative requirements and your individual expectations, focused on State Aid support for projects approved under the PV IPCEI.

We, FuturaSun, Coveme, Enea, Applied Materials, Eurac research, Standex International Italy, Enel, are participating in this IPCEI initiative and striving for the adequate, timely and complete support for the PV industry in Europe. Your initial support and further actions in developing the PV IPCEI would benefit the interest of our industrial strategy and the key expectations of European citizens for the Green Deal to ensure economic growth, jobs and sustainable competitiveness.

[Title and signature of the company/institution]

Enel

Direttore Italia Enel

(Carlo Tamburi)

Carlo Tamburi

MD - Chief Innovation & Technology Officer
Standex International - Italy
Flavio Maschera

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Stefano Audelini

ANNEXES:

- I) Background information on PV IPCEI;
- II) Important Project of Common European Interest – Benefits for the Participants.

I) Background information on PV IPCEI

With the launch of the ambitious Green Deal targets for the European Union and its further commitments amongst the EU Member States, it is clear that the EU will have enormous opportunities to make extensive reforms in the green industry landscape. It is, however, of critical importance to not harm the European citizens and European industry when making these changes, which makes the timing of essence.

The recent increase in PV deployment in Europe brings enormous challenges. In 2020, new wind power installations in the EU accounted for 14.7 GW, and new solar PV installations reached 20.6 GW in additional installed capacity. According to short term forecasts, the annual solar PV installations in Europe will double very soon – reaching 40-45 GW already in 2023-2024.¹ However, the current PV manufacturing capacities in the EU are critically low, representing only 0.4% of global cell and 4% of global module production.

The existing and forecasted gap between PV demand in Europe and PV manufacturing capacities will put the EU and the European countries into a new type of energy dependency, by importing large quantities of the critical hardware for the green transition. The current logistical challenges and skyrocketing price increases of the PV modules from Asian countries clearly demonstrates the critical need for the EU to take comprehensive actions without delay to safeguard both the achievement of the ambitious Green Deal targets and the sustainably competitive European PV manufacturing industry.

A vital PV industry, and in particular a PV manufacturing industry, is one of the practical measures to ensure the strategic autonomy of Europe in times of high uncertainty of raw material supply and global logistical challenges. The urgency of the situation has been demonstrated in multiple technological sectors in the past years. Various opportunities are emerging, which are instrumental for achieving the Green Deal objectives, including but not limiting to NextGenerationEU, the Recovery and Resilience Facility, the Just Transition Fund, and European policy advancements through “Fit for 55” climate package. However, the sustainable competitiveness of the European PV manufacturing could be ensured only by innovative PV manufacturing and its full commercial deployment. IPCEI could be one of the key support instruments to bring necessary financing and addressing the considerable technological and financial risks for the European companies to achieve a breakthrough in high-efficiency PV cells production and other innovations in the whole PV manufacturing value chain.

At EU level, the renewable energy industry has been identified as one of the fourteen key industrial ecosystems to the European Union. In the updated Industrial Strategy published in May 2021, the European Commission has highlighted “the importance of regaining and strengthening EU’s competitive edge in the solar photovoltaic industry” and of “building a sizeable EU PV manufacturing industry”. The European PV industry took necessary actions with the dedicated vision to put the European PV innovations and the whole value chain into IPCEI framework. In February 2021, a European Solar Initiative was launched together with the Commissioner for Internal Market Thierry Breton and the Commissioner for Energy Kadri Simson, upon the initiative of SolarPower Europe and EIT InnoEnergy replicating the blueprint of the Battery Alliance. In July 2021, the process for an PV IPCEI was initiated and until now the governance and operational structure of the initiative has been framed including proposed 5 concrete PV IPCEI projects which now are under cooperative development. The European Commission Communication on IPCEIs are now under revision with the foreseen entering into force from January 2022.

The essence of the IPCEI is to ensure the appropriate and adequate support for the respective projects, through the participation and further commitment of the Member States under the IPCEI granting conditions, supervised and operated by the European Commission.

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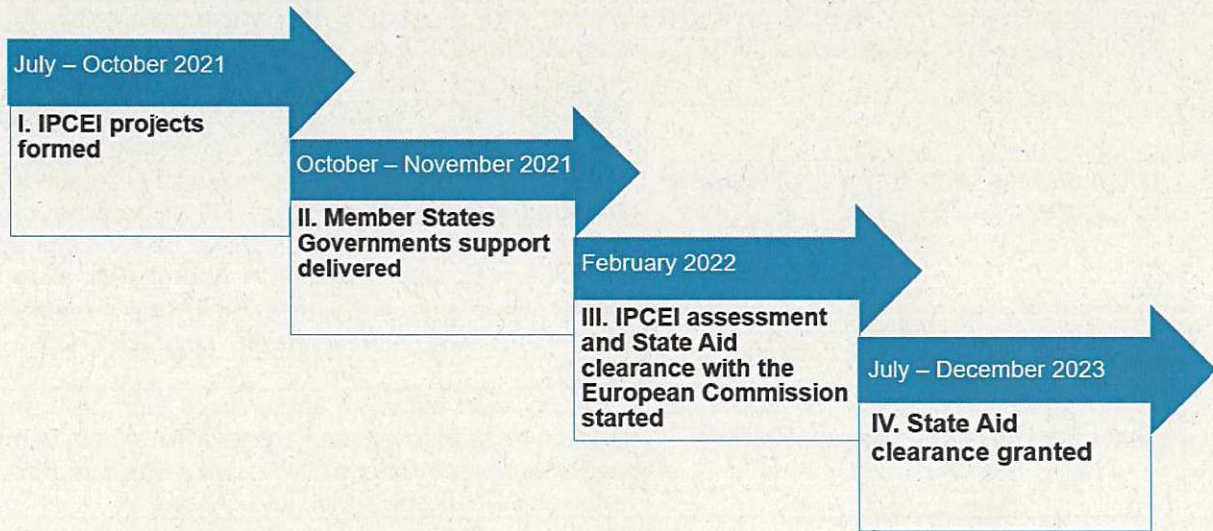
Currently, these 5 projects initiated under the PV IPCEI framework includes the following PV manufacturing innovations:

No.	Project title	Goals of the project
1.	Industrializing Heterojunction Cell and Module Technology to the Gigawatt Scale while manufacturing high performance Heterojunction solar cells	Establish within the next 7 years, 15 Gigawatt (GW) of PV cell and module manufacturing in Europe, on the basis of the highly efficient Heterojunction Technology (HJT). The first stage of the project will be the implementation of innovative HJT PV cell and module manufacturing pilot lines during 2022.
2.	Manufacturing of TOPCon PV cells and silver paste with optimised silver contacts	Extend the European PV value chain by local manufacturing of silver paste and novel PV cells. The innovation will focus on reduction of cost of silver contacts on silicon TOPCon cells, without compromising the advantages of the technology.
3.	Industrializing Tandem PV technology to the Gigawatt scale	To bring Tandem Silicon-Perovskite PV technology at industrial maturity and Gigawatt scale production establishing a production of 3 GW of PV cells and modules in Europe. Tandem technology will allow to overcome Silicon cell power efficiency conversion exceeding 30% and to lower Levelized Cost of Energy.
4.	PV integrated solutions for buildings, infrastructure and various applications	Develop and establish large-scale Europe based production of innovative integrated PV solutions. For applications in buildings (BIPV), infrastructure (IIPV), vehicles (VIPV) and agriculture (Agro-PV).
5.	Circular PV production	To ensure that PV would be the best-in-class of environmental technologies on sustainability by minimizing the environmental impact from PV manufacturing and end-of-life.

No.	Project title	Confirmed partners
1.	Industrializing heterojunction cell and module technology to the Gigawatt scale	
2.	Manufacturing of TOPCon PV cells and silver paste	
3.	Industrializing Tandem PV technology to the Gigawatt scale	
4.	PV integrated solutions	
5.	Circular PV production	

The PV IPCEI framework has been initiated and started to be established in July 2021. Although the IPCEI process is rather complex the following vision has been confirmed to finalize the State aid procedures in 2023. Close cooperation among the PV IPCEI partners and participating Member States and their early involvement in the process is one of the key factors for the successful confirmation of the IPCEI status for PV industry and the implementation of the foreseen projects. The proposed projects are being formed currently – accordingly there are all the possibilities to include the new projects or adapt the ongoing projects in line with the views of joining Member States and partners.

Planned PV IPCEI schedule (2021 – 2023)



II) IMPORTANT PROJECT OF COMMON EUROPEAN INTEREST – BENEFITS FOR THE PARTICIPANTS

Background: The EU IPCEI process is dedicated to promoting innovative industrial deployment by allowing circumventions of state aid regulations and thereby permitting private-public joint financing. The IPCEI mechanisms permits EU Member States to support transnational projects of strategic significance. These highly innovative projects should contribute to economic growth, jobs and competitiveness. EU State Aid rules makes an exemption for such activities under the framework of IPCEI, but it still requires the approval of the European Commission. The evaluation is being made mainly on individual projects, but the approval is made for the package of the projects. Any IPCEI project should prove the existing considerable technological or financial risks for the deployment of the innovation and how this will benefit the companies.

I. WHY AN IPCEI FOR PV MANUFACTURING IS CRITICALLY IMPORTANT?

- Any of the financial support dedicated for PV manufacturing should be approved by the European Commission. **IPCEI could be one of the support instruments to bring necessary financing for the European companies to innovation** to make a breakthrough in high-efficiency PV cell production and other innovations in the PV manufacturing value chain.
- **IPCEI could directly** (through approval of the framework and financing) **or indirectly** (discussing and completion of the necessary procedures automatically triggers political attention to the issues of PV manufacturing in Europe) **impact the policy framework for PV manufacturing on the national and EU level, which further could be transferred to other attractive funding instruments**, such as the Recovery and Resilience Facility, the Just Transition Fund, EU State Aid Guidelines, or General Block Exemption Regulation.

II. WHAT ARE THE CONCRETE BENEFITS FOR THE COMPANIES PARTICIPATING IN IPCEI?

- **Safeguarded commitment of the Member States on financing.** During the notification process, Member States should commit to certain concrete levels of financial support, to be dedicated to the specific IPCEI topic and to concrete projects within the Member State.
- **Better conditions for PV innovation industry development and launch of concrete innovation within the company with high technological or financial risks.** In case of a positive proof of the ambitious targets for Research, Development, Innovation, and First Industrial Deployment, companies could benefit from direct financial support up to 100% of a financing gap.
- **For companies joining the IPCEI framework early, the chances are better for individual approval and easier coordination during the process.** For Member States or companies that are joining later to the already launched IPCEI, there is a need to prove additionality. Accordingly, the European Commission recommends joining IPCEI initiative at the beginning.

III. WHY THE IPCEI ON PV INNOVATION AND MANUFACTURING IS MORE REALISTIC NOW THAN EVER BEFORE?

- **The European Commission is currently reviewing the IPCEI guidelines** with a targeted vision to (a) simplify the rules of IPCEI adoption, (b) to expand its applicability to small and medium-sized enterprises and (c) to enhance IPCEI consistency with EU policies, enabling green and digital transformation.
- **The newly updated European Industrial Strategy explicitly supports IPCEIs** with the target to pool public resources in areas where the market alone cannot deliver breakthrough innovation. Additional IPCEIs under current discussion are next-generation cloud, hydrogen, low-carbon industry, pharmaceuticals, and a second IPCEI on semi-conductor microelectronics. IPCEI framework for the PV has been initiated with the purpose to include PV innovation and manufacturing to this list.

IV. CAN SMALL COMPANIES WITH LIMITED BUDGET BE PART OF AN IPCEI?

- **The European Commission is not limiting, but rather promoting the participation of small companies or Small and Medium Enterprises (SMEs) to participate in IPCEI.** The participation of small companies or entities could even maximize the chances of the PV manufacturing to be approved the status of IPCEI. According to the current European Commission *criteria for the analysis of the*

compatibility with the internal market of State aid to promote the execution of Important Projects of Common European Interest:

- European Commission will take a more favourable approach where the project involves important collaborative interactions in terms of number of partners, involvement of organisations of different sectors, or the involvement of undertakings of different sizes.
- The Member States, after forming IPCEI and after approval of the State aid shall ensure certain transparency by the publication of the information about granted State aid on a comprehensive State aid website, at national or regional level – such requirement can be waived with respect to individual aid awards below EUR 500 000.
- In general, one of the objectives of the ongoing review of the current State aid Guidelines by the European Commission is general intention to make favourable conditions for SMEs – accordingly additional bonuses are planned to be given for SMEs in the State aid clearance process.
- **There are different forms of participation in the IPCEI for the companies**, such as direct participation, external partnerships or collaborations with the participants of the IPCEI. This ensures the participation flexibility in IPCEI for all companies or entities, including small companies and SMEs – the most appropriate participation form could be selected by the companies itself.

V. EXAMPLES OF IPCEIs:

- **Battery value chain** (2019-2031) — 7 Member States and 17 companies participating, €3.2 billion funding approved, expected an additional €5 billion in private investment. Average dedicated support is €457 million per country.
 - **EuBatIn – European Batteries Innovation** (2020-2028) — 12 Member States and 42 companies participating, €2.9 billion funding approved, expected an additional €9 billion in private investment. Average dedicated support is €242 million per country.
 - **Microelectronics** (2018-2024) — 4 Member States and 29 companies participating, €1.75 billion funding approved, expected an additional €6 billion in private investment. Average dedicated support is €438 million per country.
 - **Hydrogen** — ongoing process, decision expected at the end of 2021.
-

20. Dezember 2021

An den Bundesminister
für Wirtschaft und Klimaschutz
Herrn Dr. Robert Habeck

11019 Berlin

Um die Transformation zu schaffen, brauchen wir lokale PV Produktion

Einladung zur Teilnahme an einem wichtigen Projekt von gemeinsamem europäischem Interesse (IPCEI) zur Unterstützung der Solar-Photovoltaik-Herstellungsinndustrie in Europa

Sehr geehrter Herr Dr. Habeck,

Herzlichen Glückwunsch zu Ihrer Ernennung zum Minister für Wirtschaft, Energie und Klimaschutz!

Wir möchten Sie als Vertreter der Bundesregierung zu einer Diskussion über den Aufbau einer Produktion von Solar-Photovoltaik (PV) entlang der Wertschöpfungskette in Europa einladen.

Photovoltaik ist bereits weltweit die Stromquelle mit den niedrigsten Stromgestehungskosten. Der weltweite Ausbau der jährlichen Produktionskapazität auf 600 GW bis 2030 ist übereinstimmend prognostiziert. Um die definierten Klimaziele zu erreichen, den CO2 Footprint zu verringern und international unabhängig zu bleiben, sollten 100 GW davon in Europa produziert werden – das ist ein großes Ziel. Nahezu die komplette Fertigung von Wafern, Solarzellen und auch Solarmodulen ist inzwischen in Asien, insbesondere in China. Noch ist viel Fachwissen in Europa vorhanden und deutsche Firmen und Institute sind führend bei der Entwicklung von leistungsfähigen Solarzellen. Allerdings entwickelt sich das produktionsrelevante Knowhow inzwischen deutlich stärker in China. Mit Blick auf die umfangreichen Förderprogramme für PV, die derzeit in den USA, in Indien und weiteren großen Ländern entwickelt werden, hat die EU immer noch die Chance, rechtzeitig eine wettbewerbsfähige PV-Produktionsindustrie auf der Grundlage der vorgeschlagenen IPCEI-Roadmap und flankiert von gezielten Maßnahmen aufzubauen.

Im Namen der europäischen PV-Herstellungsinndustrie möchten wir auf den kritischen Zeitpunkt und die Notwendigkeit der Stärkung der Wertschöpfungskette der PV Produktion

in Europa hinweisen. So haben knappe europäische Ressourcen bei medizinischen Produkten uns in der Corona Krise die Folgen der Abhängigkeit kritischer Infrastruktur und Produkte gezeigt. Für die Produktion von Energie sollten wir uns unabhängiger machen. Im Februar 2021 wurde gemeinsam mit Binnenmarkt-Kommissar Thierry Breton und Energiekommissar Kadri Simson eine europäische Solarinitiative ins Leben gerufen, die das strategische Ziel verfolgt, bis 2025 in Europa 20 GW an PV-Produktionskapazitäten entlang der gesamten Wertschöpfungskette neu zu entwickeln.

In diesem Rahmen wurde im Juli dieses Jahres ein wichtiges Projekt von gemeinsamem europäischem Interesse (IPCEI) für die PV-Herstellung initiiert, das vom European Solar Manufacturing Council (ESMC) geleitet wird und die Akteure der europäischen PV-Industrie zusammenbringt.

Projekte aus der gesamten Wertschöpfungskette sollen den dringenden Bedarf an der Entwicklung von Technologien für erneuerbare Energien sowie an Fertigungskapazitäten decken, und sie werden eine wichtige Rolle für die internationale Wettbewerbsfähigkeit der gesamten europäischen PV-Industrie spielen. Das passt dann hervorragend zu den bestehenden IPCEI Projekten im Bereich Wasserstoff und Batterieforschung, welche Energie aus erneuerbaren Energien wie z.B. Photovoltaik benötigen. Dies vervollständigt die Energietransformation mit maximaler Wertschöpfung in Deutschland und in der EU.

Die Integration der gesamten PV-Wertschöpfungskette spiegelt sich bereits in der aktiven und direkten Beteiligung von 50 Unternehmen und Institutionen an dieser Initiative aus **Österreich, Belgien, Finnland, Frankreich, Deutschland, Italien, Litauen, den Niederlanden, Norwegen, Polen, Spanien, Schweden, der Schweiz und dem Vereinigten Königreich** an dieser IPCEI-Initiative wider: 3S Solar Plus, AGC, Applied Materials, Coveme, ENEA, Enel Green Power, Evolar, Eurac Research, **Fraunhofer ISE**, Futurasun, Giga PV, **h.a.i.m. elektronik**, H2GEMINI Technologies, IFE, Imec, INES, Institut für Erneuerbare Energien, IPVF, **ISC Konstanz**, KGHM, **LuxChemtech**, **MCPV**, Metsolar, Mondragon Assembly, **NexWafe**, Norsun, **RCT Solutions**, Rise Technologies, Oxford PV, EDF ENR PWT (Photowatt), Protech, REC Solar Norway, **Siemens**, **Singulus Technologies**, Sintef, Smart Energy DIH, Solarge, **Solarwatt**, Solean, Solitek, Soltec, Standex, **Teamtechnik**, Tecnalia, Ulbrich, Valoe, **Vitronic**, VOLTEC Solar, **VON ARDENNE**, **ZS-Handling**.

Die europäische PV-Industrie lädt die Bundesregierung ein, sich diesem Prozess anzuschließen, indem Sie Ihr grundsätzliches Interesse an einer Unterstützung der PV-IPCEI Initiative bestätigt. Für eine positive Antwort und Ihre Bestätigung bis Januar 2022

bedanken wir uns jetzt schon. Mitgliedstaaten, die ihre Unterstützung früher bekunden, haben einen zeitlichen und politischen Vorteil im Rahmen von PV-IPCEI, da die Art und Anzahl der initiierten Projekte noch beeinflusst werden kann.

Die Bestätigung Ihrer Unterstützung ist ein entscheidender Vorteil für alle aktiv beteiligten deutschen Unternehmen sowie für die gesamte europäische PV-Industrie und ihre zukünftige Wettbewerbsfähigkeit. Wir kommen damit nicht nur den gesetzten Klimazielen näher, es entstehen auch zehntausende von Arbeitsplätzen in Europa.

Im Anschluss an Ihre bestätigte Unterstützung wird in enger Zusammenarbeit mit der Europäischen Kommission ein gemeinsames Arbeitsprogramm für die PV-IPCEI auf den Weg gebracht, das den gesetzlichen Anforderungen der IPCEI und Ihren individuellen Erwartungen entspricht und sich auf die Unterstützung staatlicher Beihilfen für im Rahmen der PV-IPCEI genehmigte Projekte konzentriert.

Wir, die unterzeichnenden Firmen und Institutionen, beteiligen uns an dieser IPCEI-Initiative und streben eine angemessene, effektive und rechtzeitige Unterstützung für die PV-Industrie in Europa an. Ihre anfängliche Unterstützung und weitere Maßnahmen zur Entwicklung der PV-IPCEI würden den Interessen unserer Industriestrategie und den wichtigsten Erwartungen der europäischen Bürger an den Green Deal zur Sicherung von Wirtschaftswachstum, Arbeitsplätzen und nachhaltiger Wettbewerbsfähigkeit zugutekommen.

Natürlich sind wir gern bereit, dazu Diskussionen und Gesprächsrunden in Ihrem Haus zu führen.

Mit freundlichen Grüßen

European Solar Manufacturing Council



.....
Prof. Eicke Weber, Co-President ESMC



.....
Dr.-Ing. Stefan Rinck, Board Member ESMC

In Kopie an: Staatssekretäre Dr. Patrick Graichen und Sven Giegold

Anhang:

- I) Background information on PV IPCEI
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IPCEI-Initiative Bundesrepublik Deutschland: Fraunhofer ISE, h.a.l.m. elektronik, ISC Konstanz, LuxChemtech, MCPV, NexWafe, RCT Solutions, Siemens, Singulus Technologies, Solarwatt, Teamtechnik, Vitronic, VON ARDENNE, ZS-Handling.



Prof. Dr. Andreas Bett
Fraunhofer-Institut für Solare Energiesysteme ISE, Institutsleiter
Albert-Ludwigs-Universität Freiburg, Solar Energy – Materials and Technology

h.a.l.m. elektronik GmbH


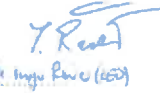


Moritz Meixner
Geschäftsführer

ISC Konstanz e.V.



Rudolf Harney, Vorstand

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Dr. Westram (CEO) Dr. Ingo Rwe (CEO)

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Dr. Peter Fath
CEO

Solarwatt GmbH



Dr. Armin Froltzhelm / Managing Director & CTO

SINGULUS TECHNOLOGIES AG



Dr.-Ing. Stefan Rinck
Vorsitzender des Vorstands, CEO

VITRONIC Dr.-Ing. Stein Bildverarbeitungssysteme GmbH

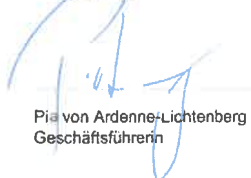


Daniel Scholz-Stein, CEO



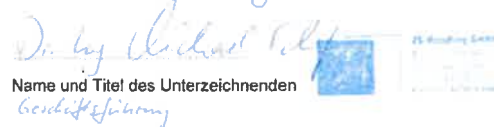
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VON ARDENNE GmbH



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Geschäftsführerin

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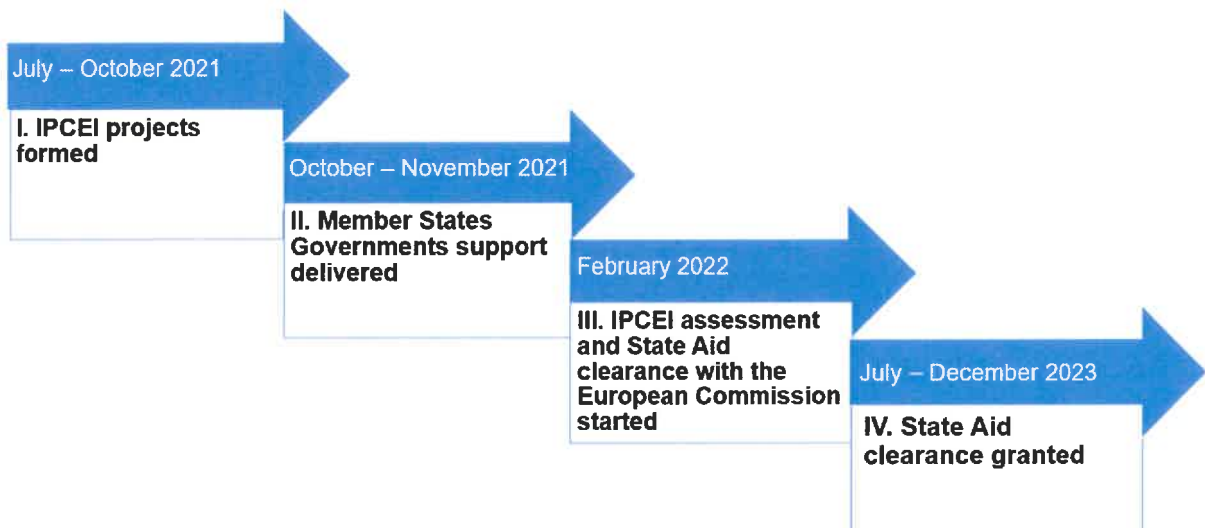
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4.	PV integrated solutions for buildings, infrastructure and various applications	Develop and establish large-scale Europe based production of innovative integrated PV solutions. For applications in buildings (BIPV), infrastructure (IIPV), vehicles (VIPV) and agriculture (Agro-PV).
5.	Circular PV production	To ensure that PV would be the best-in-class of environmental technologies on sustainability by minimizing the environmental impact from PV manufacturing and end-of-life.

<p>1. Industrializing heterojunction cell and module technology to the Gigawatt scale (27 Members)</p>	
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The PV IPCEI framework has been initiated and started to be established in July 2021. Although the IPCEI process is rather complex the following vision has been confirmed to finalize the State aid procedures in 2023. Close cooperation among the PV IPCEI partners and participating Member States and their early involvement in the process is one of the key factors for the successful confirmation of the IPCEI status for PV industry and the implementation of the foreseen projects. The proposed projects are being formed currently – accordingly there are all the possibilities to include the new projects or adapt the ongoing projects in line with the views of joining Member States and partners.

Planned PV IPCEI schedule (2021 – 2023)



II) IMPORTANT PROJECT OF COMMON EUROPEAN INTEREST – BENEFITS FOR THE PARTICIPANTS

Background: The EU IPCEI process is dedicated to promoting innovative industrial deployment by allowing circumventions of state aid regulations and thereby permitting private-public joint financing. The IPCEI mechanisms permits EU Member States to support transnational projects of strategic significance. These highly innovative projects should contribute to economic growth, jobs and competitiveness. EU State Aid rules makes an exemption for such activities under the framework of IPCEI, but it still requires the approval of the European Commission. The evaluation is being made mainly on individual projects, but the approval is made for the package of the projects. Any IPCEI project should prove the existing considerable technological or financial risks for the deployment of the innovation and how this will benefit the companies.

I. WHY AN IPCEI FOR PV MANUFACTURING IS CRITICALLY IMPORTANT?

- Any of the financial support dedicated for PV manufacturing should be approved by the European Commission. **IPCEI could be one of the support instruments to bring necessary financing for the European companies to innovation** to make a breakthrough in high-efficiency PV cell production and other innovations in the PV manufacturing value chain.
- **IPCEI could directly** (through approval of the framework and financing) **or indirectly** (discussing and completion of the necessary procedures automatically triggers political attention to the issues of PV manufacturing in Europe) **impact the policy framework for PV manufacturing on the national and EU level, which further could be transferred to other attractive funding instruments**, such as the Recovery and Resilience Facility, the Just Transition Fund, EU State Aid Guidelines, or General Block Exemption Regulation.

II. WHAT ARE THE CONCRETE BENEFITS FOR THE COMPANIES PARTICIPATING IN IPCEI?

- **Safeguarded commitment of the Member States on financing.** During the notification process, Member States should commit to certain concrete levels of financial support, to be dedicated to the specific IPCEI topic and to concrete projects within the Member State.
- **Better conditions for PV innovation industry development and launch of concrete innovation within the company with high technological or financial risks.** In case of a positive proof of the ambitious targets for Research, Development, Innovation, and First Industrial Deployment, companies could benefit from direct financial support up to 100% of a financing gap.
- **For companies joining the IPCEI framework early, the chances are better for individual approval and easier coordination during the process.** For Member States or companies that are joining later to the already launched IPCEI, there is a need to prove additionality. Accordingly, the European Commission recommends joining IPCEI initiative at the beginning.

III. WHY THE IPCEI ON PV INNOVATION AND MANUFACTURING IS MORE REALISTIC NOW THAN EVER BEFORE?

- **The European Commission is currently reviewing the IPCEI guidelines** with a targeted vision to (a) simplify the rules of IPCEI adoption, (b) to expand its applicability

to small and medium-sized enterprises and (c) to enhance IPCEI consistency with EU policies, enabling green and digital transformation.

- **The newly updated European Industrial Strategy explicitly supports IPCEIs** with the target to pool public resources in areas where the market alone cannot deliver breakthrough innovation. Additional IPCEIs under current discussion are next-generation cloud, hydrogen, low-carbon industry, pharmaceuticals, and a second IPCEI on semi-conductor microelectronics. IPCEI framework for the PV has been initiated with the purpose to include PV innovation and manufacturing to this list.

IV. CAN SMALL COMPANIES WITH LIMITED BUDGET BE PART OF AN IPCEI?

- **The European Commission is not limiting, but rather promoting the participation of small companies or Small and Medium Enterprises (SMEs) to participate in IPCEI.** The participation of small companies or entities could even maximize the chances of the PV manufacturing to be approved the status of IPCEI. According to the current European Commission *criteria for the analysis of the compatibility with the internal market of State aid to promote the execution of Important Projects of Common European Interest*:
 - European Commission will take a more favorable approach where the project involves important collaborative interactions in terms of number of partners, involvement of organizations of different sectors, or the involvement of undertakings of different sizes.
 - The Member States, after forming IPCEI and after approval of the State aid shall ensure certain transparency by the publication of the information about granted State aid on a comprehensive State aid website, at national or regional level – such requirement can be waived with respect to individual aid awards below EUR 500 000.
 - In general, one of the objectives of the ongoing review of the current State aid Guidelines by the European Commission is general intention to make favorable conditions for SMEs – accordingly additional bonuses are planned to be given for SMEs in the State aid clearance process.
- **There are different forms of participation in the IPCEI for the companies,** such as direct participation, external partnerships or collaborations with the participants of the IPCEI. This ensures the participation flexibility in IPCEI for all companies or entities, including small companies and SMEs – the most appropriate participation form could be selected by the companies itself.

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- **Battery value chain (2019-2031)** — 7 Member States and 17 companies participating, €3.2 billion funding approved, expected an additional €5 billion in private investment. Average dedicated support is €457 million per country.
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*Monsieur Bruno Le Maire
Ministre de l'Économie, des Finances et de la Relance
139, rue de Bercy
75012 Paris*

30 mars 2022

Objet: invitation à soutenir un Projet Important d'Intérêt Européen Commun (IPCEI) pour l'industrie de la fabrication de panneaux solaires photovoltaïques en Europe

Monsieur le Ministre,

Nous avons l'honneur de vous inviter, en tant que partie prenante gouvernementale, à une discussion et à des actions décisives pour le développement de l'industrie de fabrication de panneaux solaires photovoltaïques (PV) en Europe.

Au nom de la filière, nous souhaitons en effet alerter les parties prenantes sur la nécessité de renforcer les chaînes de valeur du solaire photovoltaïques au niveau communautaire. En février 2021, une initiative baptisée European Solar Initiative (ESI) a été lancée avec le Commissaire au marché intérieur Thierry Breton, et la Commissaire à l'énergie Kadri Simson, fixant l'objectif stratégique de redévelopper 20 GW de capacité de production solaire photovoltaïque en Europe d'ici 2025, et ce tout au long de la chaîne de valeur. Dans ce cadre, en juillet 2021, un Projet Important d'Intérêt Européen Commun (IPCEI) pour la fabrication photovoltaïque rassemblant les acteurs industriels européens du photovoltaïque a été initié par l'European Solar Manufacturing Council (ESMC). Les projets en cours d'élaboration associent toute la chaîne de valeur, répondent à la demande urgente du développement de technologies d'énergie renouvelable ainsi que de capacités de fabrication, et joueront un rôle important pour la compétitivité de l'ensemble de l'industrie photovoltaïque européenne.

L'intégration de l'ensemble de la chaîne de valeur photovoltaïque se reflète déjà par la participation active et directe à cette initiative IPCEI de plus de 40 entreprises et institutions d'Autriche, de Belgique, de Finlande, de France, d'Allemagne, d'Italie, de Lituanie, des Pays-Bas, de Norvège, de Pologne, d'Espagne, de Suède, de Suisse et du Royaume-Uni: 3S Solar Plus, AGC, Applied Materials, Carbon, Coveme, DualSun, ENEA, Enel Green Power, ENGIE France Renewalbes, Evolar, Fraunhofer ISE, Futurasun, Giga PV, H2GEMINI Technologies, IFE, Imec, INES, Institut Photovoltaïque d'Île-de-France (IPVF), Institute for Renewable Energy, KGHM, LuxChemtech, MCPV, Metsolar, Mondragon Assembly, Norsun, Oxford PV, EDF ENR PWT (Photowatt), Protech, REC Solar Norway, ROSI Solar, Singulus Technologies, Sintef, Smart Energy DIH, Solarge, Solean, Solitek, Ulbrich, Valoe, Vitronic, VOLTEC Solar, VON ARDENNE, ZS-Handling.

L'industrie photovoltaïque européenne invite la France à se joindre au processus, par une confirmation de votre soutien initial à l'initiative IPCEI PV. Cette confirmation de soutien constituerait un avantage clé pour les entreprises activement impliquées, ainsi que pour l'ensemble de l'industrie photovoltaïque européenne et sa compétitivité future. Par suite, un programme de travail conjoint pour l'IPCEI PV serait lancé en étroite coopération avec la Commission européenne, et conformément aux exigences législatives de l'IPCEI et à vos attentes individuelles, axé sur le soutien des aides d'État aux projets approuvés dans le cadre de l'IPCEI PV.

Nous participons à cette initiative IPCEI et nous nous efforçons d'apporter un soutien adéquat, opportun et complet à l'industrie photovoltaïque en Europe. Votre soutien et les actions que nous engagerons dans le cadre IPCEI PV participeraient du développement de l'industrie en Europe, tout en répondant aux attentes clés des citoyens européens pour le Green Deal en matière de croissance économique, création d'emploi et compétitivité durable.

Vous remerciant de votre considération, nous vous prions de bien vouloir agréer, Monsieur le Ministre, l'expression de notre très haute considération.

Vincent BES, CEO at EDF ENR PWT – PHOTOWATT



Daniel BOUR, Chairman at ENERPLAN



Laetitia Brottier, Co-founder at DualSun



Guy CHICHIGNOUD, Co-founder & CTO of ROSI Solar



Rosaline CORINTHIEN, CEO BU ENGIE France Renewables



Roch DROZDOWSKI-STREHL, CEO of IPVF, Vice-Chairman of ETIP PV



Arnaud GOY, President & CEO at SOLEAN



Anis JOUINI, CEO INES
and Head of Solar Technology Department CEA/LITEN

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Pascal Richard, CEO of CARBON



Lucas WEISS, CEO at Voltec Solar



ANNEXES:

- I) Background information on PV IPCEI;
- II) Important Project of Common European Interest – Benefits for the Participants.

I) Background information on PV IPCEI

With the launch of the ambitious Green Deal targets for the European Union and its further commitments amongst the EU Member States, it is clear that the EU will have enormous opportunities to make extensive reforms in the green industry landscape. It is, however, of critical importance to not harm the European citizens and European industry when making these changes, which makes the timing of essence.

The recent increase in PV deployment in Europe brings enormous challenges. In 2020, new wind power installations in the EU accounted for 14.7 GW, and new solar PV installations reached 20.6 GW in additional installed capacity. According to short term forecasts, the annual solar PV installations in Europe will double very soon – reaching 40-45 GW already in 2023-2024.¹ However, the current PV manufacturing capacities in the EU are critically low, representing only 0.4% of global cell and 4% of global module production.

The existing and forecasted gap between PV demand in Europe and PV manufacturing capacities will put the EU and the European countries into a new type of energy dependency, by importing large quantities of the critical hardware for the green transition. The current logistical challenges and sky-rocketing price increases of the PV modules from Asian countries clearly demonstrates the critical need for the EU to take comprehensive actions without delay to safeguard both the achievement of the ambitious Green Deal targets and the sustainably competitive European PV manufacturing industry.

A vital PV industry, and in particular a PV manufacturing industry, is one of the practical measures to ensure the strategic autonomy of Europe in times of high uncertainty of raw material supply and global logistical challenges. The urgency of the situation has been demonstrated in multiple technological sectors in the past years. Various opportunities are emerging, which are instrumental for achieving the Green Deal objectives, including but not limiting to NextGenerationEU, the Recovery and Resilience Facility, the Just Transition Fund, and European policy advancements through “Fit for 55” climate package. However, the sustainable competitiveness of the European PV manufacturing could be ensured only by innovative PV manufacturing and its full commercial deployment. IPCEI could be one of the key support instruments to bring necessary financing and addressing the considerable technological and financial risks for the European companies to achieve a breakthrough in high-efficiency PV cells production and other innovations in the whole PV manufacturing value chain.

At EU level, the renewable energy industry has been identified as one of the fourteen key industrial ecosystems to the European Union. In the updated Industrial Strategy published in May 2021, the European Commission has highlighted “the importance of regaining and strengthening EU’s competitive edge in the solar photovoltaic industry” and of “building a sizeable EU PV manufacturing industry”. The European PV industry took necessary actions with the dedicated vision to put the European PV innovations and the whole value chain into IPCEI framework. In February 2021, a European Solar Initiative was launched together with the Commissioner for Internal Market Thierry Breton and the Commissioner for Energy Kadri Simson, upon the initiative of SolarPower Europe and EIT InnoEnergy replicating the blueprint of the Battery Alliance. In July 2021, the process for an PV IPCEI was initiated and until now the governance and operational structure of the initiative has been framed including proposed 5 concrete PV IPCEI projects which now are under cooperative development. The European Commission Communication on IPCEIs are now under revision with the foreseen entering into force from January 2022.

The essence of the IPCEI is to ensure the appropriate and adequate support for the respective projects, through the participation and further commitment of the Member States under the IPCEI granting conditions, supervised and operated by the European Commission.

¹ EU Market Outlook for Solar Power, 2020-2024, <https://www.solarpowereurope.org/european-market-outlook-for-solar-power-2020-2024/>

The European PV industry companies and research institutions are cooperating and expanding the scope of innovations to be potentially developed within the PV IPCEI framework. Initially 5 projects are proposed while the new projects could also be included under the initiative of the PV IPCEI framework participants. It is expected to frame the PV IPCEI projects including the initial support of the Member States till the end of 2021.

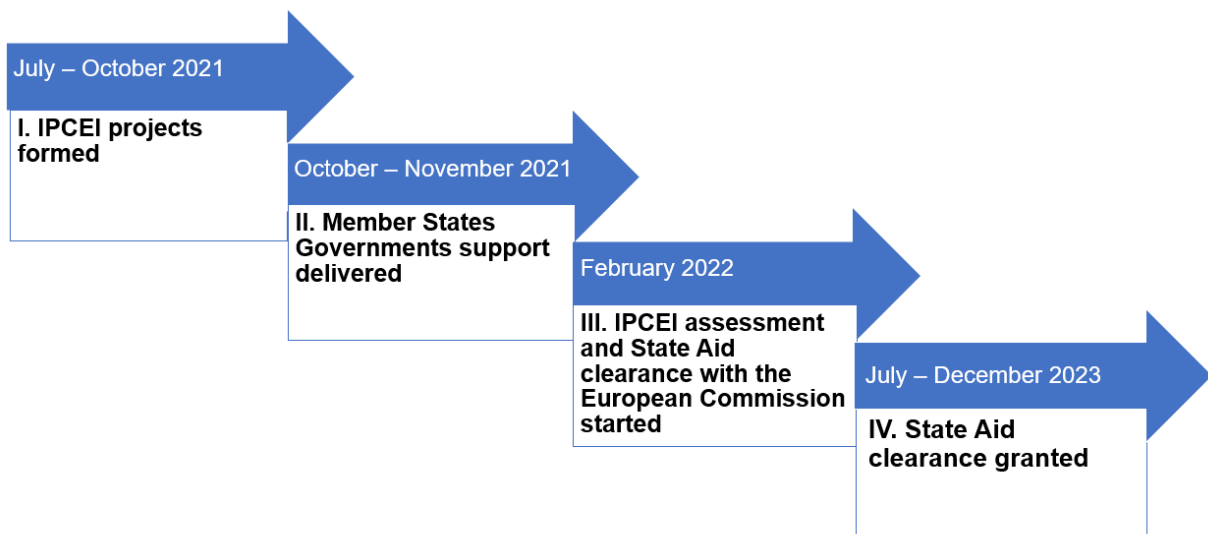
Currently, these 5 projects initiated under the PV IPCEI framework includes the following PV manufacturing innovations:

No.	Project title	Goals of the project
1.	Industrializing Heterojunction Cell and Module Technology to the Gigawatt Scale while manufacturing high performance Heterojunction solar cells	Establish within the next 7 years, 15 Gigawatt (GW) of PV cell and module manufacturing in Europe, on the basis of the highly efficient Heterojunction Technology (HJT). The first stage of the project will be the implementation of innovative HJT PV cell and module manufacturing pilot lines during 2022.
2.	Manufacturing of TOPCon PV cells and silver paste with optimised silver contacts	Extend the European PV value chain by local manufacturing of silver paste and novel PV cells. The innovation will focus on reduction of cost of silver contacts on silicon TOPCon cells, without compromising the advantages of the technology.
3.	Industrializing Tandem PV technology to the Gigawatt scale	To bring Tandem Silicon-Perovskite PV technology at industrial maturity and Gigawatt scale production establishing a production of 3 GW of PV cells and modules in Europe. Tandem technology will allow to overcome Silicon cell power efficiency conversion exceeding 30% and to lower Levelized Cost of Energy.
4.	PV integrated solutions for buildings, infrastructure and various applications	Develop and establish large-scale Europe based production of innovative integrated PV solutions. For applications in buildings (BIPV), infrastructure (IIPV), vehicles (VIPV) and agriculture (Agro-PV).
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The PV IPCEI framework has been initiated and started to be established in July 2021. Although the IPCEI process is rather complex the following vision has been confirmed to finalize the State aid procedures in 2023. Close cooperation among the PV IPCEI partners and participating Member States and their early involvement in the process is one of the key factors for the successful confirmation of the IPCEI status for PV industry and the implementation of the foreseen projects. The proposed projects are being formed currently – accordingly there are all the possibilities to include the new projects or adapt the ongoing projects in line with the views of joining Member States and partners.

Planned PV IPCEI schedule (2021 – 2023)



II) IMPORTANT PROJECT OF COMMON EUROPEAN INTEREST – BENEFITS FOR THE PARTICIPANTS

Background: The EU IPCEI process is dedicated to promoting innovative industrial deployment by allowing circumventions of state aid regulations and thereby permitting private-public joint financing. The IPCEI mechanisms permits EU Member States to support transnational projects of strategic significance. These highly innovative projects should contribute to economic growth, jobs and competitiveness. EU State Aid rules makes an exemption for such activities under the framework of IPCEI, but it still requires the approval of the European Commission. The evaluation is being made mainly on individual projects, but the approval is made for the package of the projects. Any IPCEI project should prove the existing considerable technological or financial risks for the deployment of the innovation and how this will benefit the companies.

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III. WHY THE IPCEI ON PV INNOVATION AND MANUFACTURING IS MORE REALISTIC NOW THAN EVER BEFORE?

- **The European Commission is currently reviewing the IPCEI guidelines** with a targeted vision to (a) simplify the rules of IPCEI adoption, (b) to expand its applicability to small and medium-sized enterprises and (c) to enhance IPCEI consistency with EU policies, enabling green and digital transformation.
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V. EXAMPLES OF IPCEIs:

- **Battery value chain** (2019-2031) — 7 Member States and 17 companies participating, €3.2 billion funding approved, expected an additional €5 billion in private investment. Average dedicated support is €457 million per country.
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8. April 2022

An die Bundesministerin
für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie
Fr. Leonore Gewessler
Radetzkystrasse 2
1030 Wien

Um die Transformation zu schaffen, brauchen wir lokale PV Produktion

Einladung zur Teilnahme an einem wichtigen Projekt von gemeinsamem europäischem Interesse (IPCEI) zur Unterstützung der Solar-Photovoltaik-Herstellungsinndustrie in Europa

Sehr geehrte Fr. Bundesministerin Leonore Gewessler,

Wir möchten Sie als Vertreterin der österreichischen Bundesregierung zu einer Diskussion über den Aufbau einer Produktion von Solar-Photovoltaik (PV) entlang der Wertschöpfungskette in Europa einladen.

Photovoltaik ist bereits weltweit die Stromquelle mit den niedrigsten Stromgestehungskosten. Der weltweite Ausbau der jährlichen Produktionskapazität auf 1000 GW bis 2030 ist übereinstimmend prognostiziert. Um die definierten Klimaziele zu erreichen, den CO₂ Footprint zu verringern und international unabhängig zu bleiben, sollten 100 GW davon in Europa produziert werden – das ist ein großes Ziel. Nahezu die komplette Fertigung von Wafern, Solarzellen und auch Solarmodulen ist inzwischen in Asien, insbesondere in China. Noch ist viel Fachwissen in Europa vorhanden und diverse österreichische Firmen und Institute sind aktiv an der Entwicklung von leistungsfähigen PV-Zellen, -Modulen und weiteren -Systemkomponenten beteiligt. Allerdings entwickelt sich das produktionsrelevante Know-how inzwischen deutlich stärker in China. Mit Blick auf die umfangreichen Förderprogramme für PV, die derzeit in den USA, in Indien und weiteren großen Ländern entwickelt werden, hat die EU immer noch die Chance, rechtzeitig eine wettbewerbsfähige PV-Produktionsindustrie auf der Grundlage der vorgeschlagenen IPCEI-Roadmap und flankiert von gezielten Maßnahmen aufzubauen.

Im Namen der europäischen PV-Herstellungsinndustrie möchten wir auf den kritischen Zeitpunkt und die Notwendigkeit der Stärkung der Wertschöpfungskette der PV Produktion in Europa hinweisen. So haben knappe europäische Ressourcen bei medizinischen

Produkten uns in der Corona Krise die Folgen der Abhängigkeit kritischer Infrastruktur und Produkte gezeigt. Für die Produktion von Energie sollten wir uns unabhängiger machen. Im Februar 2021 wurde gemeinsam mit Binnenmarkt-Kommissar Thierry Breton und Energiekommissar Kadri Simson eine europäische Solarinitiative ins Leben gerufen, die das strategische Ziel verfolgt, bis 2025 in Europa 20 GW an PV-Produktionskapazitäten entlang der gesamten Wertschöpfungskette neu zu entwickeln.

In diesem Rahmen wurde im Juli letzten Jahres ein wichtiges Projekt von gemeinsamem europäischem Interesse (IPCEI) für die PV-Herstellung initiiert, das vom European Solar Manufacturing Council (ESMC) geleitet wird und die Akteure der europäischen PV-Industrie zusammenbringt.

Projekte aus der gesamten Wertschöpfungskette sollen den dringenden Bedarf an der Entwicklung von Technologien für erneuerbare Energien sowie an Fertigungskapazitäten decken, und sie werden eine wichtige Rolle für die internationale Wettbewerbsfähigkeit der gesamten europäischen PV-Industrie spielen. Das passt dann hervorragend zu den bestehenden IPCEI Projekten im Bereich Wasserstoff und Batterieforschung, welche Energie aus erneuerbaren Energien wie z.B. Photovoltaik benötigen. Dies vervollständigt die Energietransformation mit maximaler Wertschöpfung in Österreich und in der EU.

Die Integration der gesamten PV-Wertschöpfungskette spiegelt sich bereits in der aktiven und direkten Beteiligung über 60 Unternehmen und Institutionen an dieser Initiative aus Österreich, Belgien, Finnland, Frankreich, Deutschland, Italien, Litauen, den Niederlanden, Norwegen, Polen, Spanien, Schweden, der Schweiz und dem Vereinigten Königreich an dieser IPCEI-Initiative wider: Seitens Österreich haben die Unternehmen Borealis, Das-Energy, Ertex-Solar, Fronius, Kioto, Lenzing Plastics, MY PV, Neoom, Prefa, Sol-Ocean, Ulbrich of Austria und Welser Profile konkretes Interesse bekundet.

Die europäische PV-Industrie lädt die österreichische Bundesregierung ein, sich diesem Prozess anzuschließen, indem Sie Ihr grundsätzliches Interesse an einer Unterstützung der PV-IPCEI Initiative bestätigt. Für eine positive Antwort und Ihre Bestätigung bis Anfang Mai 2022 bedanken wir uns jetzt schon. Mitgliedstaaten, die ihre Unterstützung früher bekunden, haben einen zeitlichen und politischen Vorteil im Rahmen von PV-IPCEI, da die Art und Anzahl der initiierten Projekte noch beeinflusst werden kann.

Die Bestätigung Ihrer Unterstützung ist ein entscheidender Vorteil für alle aktiv beteiligten österreichischen Unternehmen sowie für die gesamte europäische PV-Industrie und ihre zukünftige Wettbewerbsfähigkeit. Wir kommen damit nicht nur den gesetzten Klimazielen näher, es entstehen auch zehntausende von Arbeitsplätzen in Europa. Im Anschluss an Ihre

bestätigte Unterstützung wird in enger Zusammenarbeit mit der Europäischen Kommission ein gemeinsames Arbeitsprogramm für die PV-IPCEI auf den Weg gebracht, das den gesetzlichen Anforderungen der IPCEI und Ihren individuellen Erwartungen entspricht und sich auf die Unterstützung staatlicher Beihilfen für im Rahmen der PV-IPCEI genehmigte Projekte konzentriert.

Die beiliegenden in Österreich produzierenden und von der Österreichischen Technologieplattform Photovoltaik vertretenen Firmen laden die Österreichische Bundesregierung ein, sich an dieser IPCEI-Initiative zu beteiligen und streben eine angemessene, effektive und rechtzeitige Unterstützung für die PV-Industrie in Europa an. Ihre anfängliche Unterstützung und weitere Maßnahmen zur Entwicklung der PV-IPCEI würden den Interessen unserer Industriestrategie und den wichtigsten Erwartungen der europäischen Bürger an den Green Deal zur Sicherung von Wirtschaftswachstum, Arbeitsplätzen und nachhaltiger Wettbewerbsfähigkeit zugutekommen.

Natürlich sind wir gern bereit, dazu Diskussionen in Ihrem Haus zu führen.

Mit freundlichen Grüßen

European Solar Manufacturing Council



Prof. Eicke Weber, Co-President ESMC

Österr. Technologieplattform PV



FH-Prof. DI Hubert Fechner, Obmann TPPV

Anhang:

- I) Background information on PV IPCEI
- II) Important Project of Common European Interest – Benefits for the Participants.

With the launch of the ambitious Green Deal targets for the European Union and its further commitments amongst the EU Member States, it is clear that the EU will have enormous opportunities to make extensive reforms in the green industry landscape. It is, however, of critical importance to not harm the European citizens and European industry when making these changes, which makes the timing of essence.

The recent increase in PV deployment in Europe brings enormous challenges. In 2020, new wind power installations in the EU accounted for 14.7 GW, and new solar PV installations reached 20.6 GW in additional installed capacity. According to short term forecasts, the annual solar PV installations in Europe will double very soon – reaching 40-45 GW already in 2023-2024.¹ However, the current PV manufacturing capacities in the EU are critically low, representing only 0.4% of global cell and 4% of global module production.

The existing and forecasted gap between PV demand in Europe and PV manufacturing capacities will put the EU and the European countries into a new type of energy dependency, by importing large quantities of the critical hardware for the green transition. The current logistical challenges and sky-rocketing price increases of the PV modules from Asian countries clearly demonstrates the critical need for the EU to take comprehensive actions without delay to safeguard both the achievement of the ambitious Green Deal targets and the sustainably competitive European PV manufacturing industry.

A vital PV industry, and in particular a PV manufacturing industry, is one of the practical measures to ensure the strategic autonomy of Europe in times of high uncertainty of raw material supply and global logistical challenges. The urgency of the situation has been demonstrated in multiple technological sectors in the past years. Various opportunities are emerging, which are instrumental for achieving the Green Deal objectives, including but not limiting to Next Generation EU, the Recovery and Resilience Facility, the Just Transition Fund, and European policy advancements through “Fit for 55” climate package. However, the sustainable competitiveness of the European PV manufacturing could be ensured only by innovative PV manufacturing and its full commercial deployment. IPCEI could be one of the key support instruments to bring necessary financing and addressing the considerable technological and financial risks for the European companies to achieve a breakthrough in high-efficiency PV cells production and other innovations in the whole PV manufacturing value chain.

At EU level, the renewable energy industry has been identified as one of the fourteen key industrial ecosystems to the European Union. In the updated Industrial Strategy published in May 2021, the European Commission has highlighted “the importance of regaining and strengthening EU’s competitive edge in the solar photovoltaic industry” and of “building a sizeable EU PV manufacturing industry”. The European PV industry took necessary actions with the dedicated vision to put the European PV innovations and the whole value chain into IPCEI framework. In February 2021, a European Solar Initiative was launched together with the Commissioner for Internal Market Thierry Breton and the Commissioner for Energy Kadri Simson, upon the initiative of SolarPower Europe and EIT InnoEnergy replicating the blueprint of the Battery Alliance. In July 2021, the process for an PV IPCEI was initiated and

¹ EU Market Outlook for Solar Power, 2020-2024, <https://www.solarpowereurope.org/european-market-outlook-for-solar-power-2020-2024/>






until now the governance and operational structure of the initiative has been framed including proposed 5 concrete PV IPCEI projects which now are under cooperative development. The European Commission Communication on IPCEIs are now under revision with the foreseen entering into force from January 2022.

The essence of the IPCEI is to ensure the appropriate and adequate support for the respective projects, through the participation and further commitment of the Member States under the IPCEI granting conditions, supervised and operated by the European Commission.

The European PV industry companies and research institutions are cooperating and expanding the scope of innovations to be potentially developed within the PV IPCEI framework. Initially 5 projects are proposed while the new projects could also be included under the initiative of the PV IPCEI framework participants. It is expected to frame the PV IPCEI projects including the initial support of the Member States till the end of 2021.

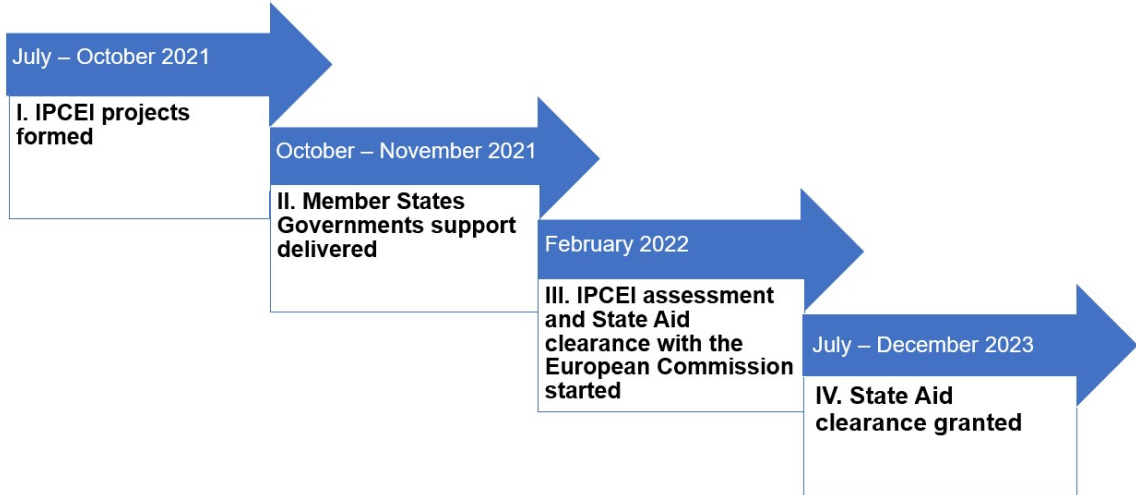
Currently, these 5 projects initiated under the PV IPCEI framework includes the following PV manufacturing innovations:

No.	Project title	Goals of the project
1.	Industrializing Heterojunction Cell and Module Technology to the Gigawatt Scale while manufacturing high performance Heterojunction solar cells	Establish within the next 7 years, 15 Gigawatt (GW) of PV cell and module manufacturing in Europe, on the basis of the highly efficient Heterojunction Technology (HJT). The first stage of the project will be the implementation of innovative HJT PV cell and module manufacturing pilot lines during 2022.
2.	Manufacturing of TOPCon PV cells and silver paste with optimized silver contacts	Extend the European PV value chain by local manufacturing of silver paste and novel PV cells. The innovation will focus on reduction of cost of silver contacts on silicon TOPCon cells, without compromising the advantages of the technology.
3.	Industrializing Tandem PV technology to the Gigawatt scale	To bring Tandem Silicon-Perovskite PV technology at industrial maturity and Gigawatt scale production establishing a production of 3 GW of PV cells and modules in Europe. Tandem technology will allow to overcome Silicon cell power efficiency conversion exceeding 30% and to lower Levelized Cost of Energy.
4.	PV integrated solutions for buildings, infrastructure and various applications	Develop and establish large-scale Europe based production of innovative integrated PV solutions. For applications in buildings (BIPV), infrastructure (IIPV), vehicles (VIPV) and agriculture (Agro-PV).
5.	Circular PV production	To ensure that PV would be the best-in-class of environmental technologies on sustainability by minimizing the environmental impact from PV manufacturing and end-of-life.

<p>1. Industrializing heterojunction cell and module technology to the Gigawatt scale (30 Members)</p>	
<p>2. Manufacturing of TOPCon PV cells and silver paste (16 Members)</p>	
<p>3. Industrializing Tandem PV technology to the Gigawatt scale (27 Members)</p>	
<p>4. PV integrated solutions (19 Members)</p>	
<p>5. Circular PV production (27 Members)</p>	

The PV IPCEI framework has been initiated and started to be established in July 2021. Although the IPCEI process is rather complex the following vision has been confirmed to finalize the State aid procedures in 2023. Close cooperation among the PV IPCEI partners and participating Member States and their early involvement in the process is one of the key factors for the successful confirmation of the IPCEI status for PV industry and the implementation of the foreseen projects. The proposed projects are being formed currently – accordingly there are all the possibilities to include the new projects or adapt the ongoing projects in line with the views of joining Member States and partners.

Planned PV IPCEI schedule (2021 – 2023)



II) IMPORTANT PROJECT OF COMMON EUROPEAN INTEREST – BENEFITS FOR THE PARTICIPANTS

Background: The EU IPCEI process is dedicated to promoting innovative industrial deployment by allowing circumventions of state aid regulations and thereby permitting private-public joint financing. The IPCEI mechanisms permits EU Member States to support transnational projects of strategic significance. These highly innovative projects should contribute to economic growth, jobs and competitiveness. EU State Aid rules makes an exemption for such activities under the framework of IPCEI, but it still requires the approval of the European Commission. The evaluation is being made mainly on individual projects, but the approval is made for the package of the projects. Any IPCEI project should prove the existing considerable technological or financial risks for the deployment of the innovation and how this will benefit the companies.

I. WHY AN IPCEI FOR PV MANUFACTURING IS CRITICALLY IMPORTANT?

- Any of the financial support dedicated for PV manufacturing should be approved by the European Commission. **IPCEI could be one of the support instruments to bring necessary financing for the European companies to innovation** to make a breakthrough in high-efficiency PV cell production and other innovations in the PV manufacturing value chain.
- **IPCEI could directly** (through approval of the framework and financing) **or indirectly** (discussing and completion of the necessary procedures automatically triggers political attention to the issues of PV manufacturing in Europe) **impact the policy framework for PV manufacturing on the national and EU level, which further could be transferred to other attractive funding instruments**, such as the Recovery and Resilience Facility, the Just Transition Fund, EU State Aid Guidelines, or General Block Exemption Regulation.

II. WHAT ARE THE CONCRETE BENEFITS FOR THE COMPANIES PARTICIPATING IN IPCEI?

- **Safeguarded commitment of the Member States on financing.** During the notification process, Member States should commit to certain concrete levels of financial support, to be dedicated to the specific IPCEI topic and to concrete projects within the Member State.
- **Better conditions for PV innovation industry development and launch of concrete innovation within the company with high technological or financial risks.** In case of a positive proof of the ambitious targets for Research, Development, Innovation, and First Industrial Deployment, companies could benefit from direct financial support up to 100% of a financing gap.
- **For companies joining the IPCEI framework early, the chances are better for individual approval and easier coordination during the process.** For Member States or companies that are joining later to the already launched IPCEI, there is a need to prove additionality. Accordingly, the European Commission recommends joining IPCEI initiative at the beginning.

III. WHY THE IPCEI ON PV INNOVATION AND MANUFACTURING IS MORE REALISTIC NOW THAN EVER BEFORE?

- **The European Commission is currently reviewing the IPCEI guidelines** with a targeted vision to (a) simplify the rules of IPCEI adoption, (b) to expand its applicability

to small and medium-sized enterprises and (c) to enhance IPCEI consistency with EU policies, enabling green and digital transformation.

- **The newly updated European Industrial Strategy explicitly supports IPCEIs** with the target to pool public resources in areas where the market alone cannot deliver breakthrough innovation. Additional IPCEIs under current discussion are next-generation cloud, hydrogen, low-carbon industry, pharmaceuticals, and a second IPCEI on semi-conductor microelectronics. IPCEI framework for the PV has been initiated with the purpose to include PV innovation and manufacturing to this list.

IV. CAN SMALL COMPANIES WITH LIMITED BUDGET BE PART OF AN IPCEI?

- **The European Commission is not limiting, but rather promoting the participation of small companies or Small and Medium Enterprises (SMEs) to participate in IPCEI.** The participation of small companies or entities could even maximize the chances of the PV manufacturing to be approved the status of IPCEI. According to the current European Commission *criteria for the analysis of the compatibility with the internal market of State aid to promote the execution of Important Projects of Common European Interest*:
 - European Commission will take a more favorable approach where the project involves important collaborative interactions in terms of number of partners, involvement of organizations of different sectors, or the involvement of undertakings of different sizes.
 - The Member States, after forming IPCEI and after approval of the State aid shall ensure certain transparency by the publication of the information about granted State aid on a comprehensive State aid website, at national or regional level – such requirement can be waived with respect to individual aid awards below EUR 500 000.
 - In general, one of the objectives of the ongoing review of the current State aid Guidelines by the European Commission is general intention to make favorable conditions for SMEs – accordingly additional bonuses are planned to be given for SMEs in the State aid clearance process.
- **There are different forms of participation in the IPCEI for the companies**, such as direct participation, external partnerships or collaborations with the participants of the IPCEI. This ensures the participation flexibility in IPCEI for all companies or entities, including small companies and SMEs – the most appropriate participation form could be selected by the companies itself.

V. EXAMPLES OF IPCEIs:

- **Battery value chain** (2019-2031) — 7 Member States and 17 companies participating, €3.2 billion funding approved, expected an additional €5 billion in private investment. Average dedicated support is €457 million per country.
 - **EuBatIn – European Batteries Innovation** (2020-2028) — 12 Member States and 42 companies participating, €2.9 billion funding approved, expected an additional €9 billion in private investment. Average dedicated support is €242 million per country.
 - **Microelectronics** (2018-2024) — 4 Member States and 29 companies participating, €1.75 billion funding approved, expected an additional €6 billion in private investment. Average dedicated support is €438 million per country.
 - **Hydrogen** — ongoing process, IPCEI pre-notified to the European Commission.
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[Title of the ministry/governmental institution to which the invitation is addressed]

07 February 2022

Invitation to join Important Project of Common European Interest framework for the solar PV manufacturing industry in Europe




We are pleased to invite you as the Governmental stakeholder to a discussion and decisive actions for the strategic perspectives of the solar photovoltaics (PV) manufacturing industry in Europe.

On behalf of the European PV manufacturing industry, we want to alert the stakeholders on the critical timing and on the need to strengthen the European PV value chains. In February 2021, a European Solar Initiative was launched together with the Commissioner for Internal Market Thierry Breton and the Commissioner for Energy Simson, setting the strategic objective of redeveloping 20 GW of solar PV manufacturing capacity in Europe by 2025 and along the full value chain. In that framework, this year in July an Important Project of Common European Interest (IPCEI) for PV manufacturing was initiated led by the European Solar Manufacturing Council (ESMC) and gathering the European PV industrial actors. Projects from across the value chain will meet the urgent demand for renewable energy technology development as well as manufacturing capacities and will play an important role for the competitiveness of the entire European PV industry.

The integration of the whole PV value chain is already reflected by the active and direct involvement in this IPCEI initiative of more than 50 companies and institutions from Austria, Belgium, Finland, France, Germany, Italy, Lithuania, Netherlands, Norway, Poland, Spain, Sweden, Switzerland and United Kingdom: 3S Solar Plus, AGC, Applied Materials, CEA, Coveme, ENEA, Enel Green Power, Evolar, Eurac Research, Fraunhofer ISE, Futurasun, Giga PV, h.a.l.m. elektronik, H2GEMINI Technologies, IFE, Imec, INES, Institut für Erneuerbare Energien, IPVF, ISC Konstanz, KGHM, LuxChemtech, MCPV, Metsolar, Mondragon Assembly, NexWafe, Norsun, RCT Solutions, Rise Technologies, Oxford PV, EDF ENR PWT (Photowatt), Protech, REC Solar Norway, Siemens, Singulus Technologies, Sintef, Smart Energy DIH, Solarge, Solarwatt, Solean, Solitek, Soltec, Standex, Teamtechnik, Tecnalía, Ulbrich, Valoe, Vitronic, VOLTEC Solar, VON ARDENNE, ZS-Handling.

The European PV manufacturing industry is kindly inviting Kingdom of Spain to join the process by confirming your initial support for the PV IPCEI initiative. The receipt of your confirmation during February 2022 would be highly appreciated. Member States expressing their support earlier will have a time and policy framing advantage in the PV IPCEI framework as the number of the initiated projects could be expanded. Your support confirmation will constitute a key benefit for the actively involved companies, as well as for the entire European PV manufacturing industry and its future competitiveness. Following your confirmed support, a joint work programme for the PV IPCEI will be launched in close cooperation with the European Commission, and in line with the IPCEI legislative requirements and your individual expectations, focused on State Aid support for projects approved under the PV IPCEI.

We **MONDRAGON ASSEMBLY S. COOP.**, **SOLTEC** and **TECNALIA R&I** are participating in this IPCEI initiative and striving for the adequate, timely and complete support for the PV industry in Europe. Your initial support and further actions in developing the PV IPCEI would benefit the interest of our industrial strategy and the key expectations of European citizens for the Green Deal to ensure economic growth, jobs and sustainable competitiveness.

<p>MONDRAGON ASSEMBLY S. COOP. Jean-Philippe Aguerre R&D Manager</p> 	<p>SOLTEC Eduardo de San Nicolás Juárez Chief Strategy & Innovation Office</p> <p>DocuSigned by:  833D6D4245DF400...</p>	<p>TECNALIA R&I Paco Cano Solar Energy Director</p> 
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ANNEXES:

- I) Background information on PV IPCEI;
- II) Important Project of Common European Interest – Benefits for the Participants.

I) Background information on PV IPCEI

With the launch of the ambitious Green Deal targets for the European Union and its further commitments amongst the EU Member States, it is clear that the EU will have enormous opportunities to make extensive reforms in the green industry landscape. It is, however, of critical importance to not harm the European citizens and European industry when making these changes, which makes the timing of essence.

The recent increase in PV deployment in Europe brings enormous challenges. In 2020, new wind power installations in the EU accounted for 14.7 GW, and new solar PV installations reached 20.6 GW in additional installed capacity. According to short term forecasts, the annual solar PV installations in Europe will double very soon – reaching 40-45 GW already in 2023-2024.¹ However, the current PV manufacturing capacities in the EU are critically low, representing only 0.4% of global cell and 4% of global module production.

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A vital PV industry, and in particular a PV manufacturing industry, is one of the practical measures to ensure the strategic autonomy of Europe in times of high uncertainty of raw material supply and global logistical challenges. The urgency of the situation has been demonstrated in multiple technological sectors in the past years. Various opportunities are emerging, which are instrumental for achieving the Green Deal objectives, including but not limiting to NextGenerationEU, the Recovery and Resilience Facility, the Just Transition Fund, and European policy advancements through “Fit for 55” climate package. However, the sustainable competitiveness of the European PV manufacturing could be ensured only by innovative PV manufacturing and its full commercial deployment. IPCEI could be one of the key support instruments to bring necessary financing and addressing the considerable technological and financial risks for the European companies to achieve a breakthrough in high-efficiency PV cells production and other innovations in the whole PV manufacturing value chain.

At EU level, the renewable energy industry has been identified as one of the fourteen key industrial ecosystems to the European Union. In the updated Industrial Strategy published in May 2021, the European Commission has highlighted “the importance of regaining and strengthening EU’s competitive edge in the solar photovoltaic industry” and of “building a sizeable EU PV manufacturing industry”. The European PV industry took necessary actions with the dedicated vision to put the European PV innovations and the whole value chain into IPCEI framework. In February 2021, a European Solar Initiative was launched together with the Commissioner for Internal Market Thierry Breton and the Commissioner for Energy Kadri Simson, upon the initiative of SolarPower Europe and EIT InnoEnergy replicating the blueprint of the Battery Alliance. In July 2021, the process for an PV IPCEI was initiated and until now the governance and operational structure of the initiative has been framed including proposed 5 concrete PV IPCEI projects which now are under cooperative development. The European Commission Communication on IPCEIs are now under revision with the foreseen entering into force from January 2022.





The essence of the IPCEI is to ensure the appropriate and adequate support for the respective projects, through the participation and further commitment of the Member States under the IPCEI granting conditions, supervised and operated by the European Commission.

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The European PV industry companies and research institutions are cooperating and expanding the scope of innovations to be potentially developed within the PV IPCEI framework. Initially 5 projects are proposed while the new projects could also be included under the initiative of the PV IPCEI framework participants. It is expected to frame the PV IPCEI projects including the initial support of the Member States till the end of 2021.

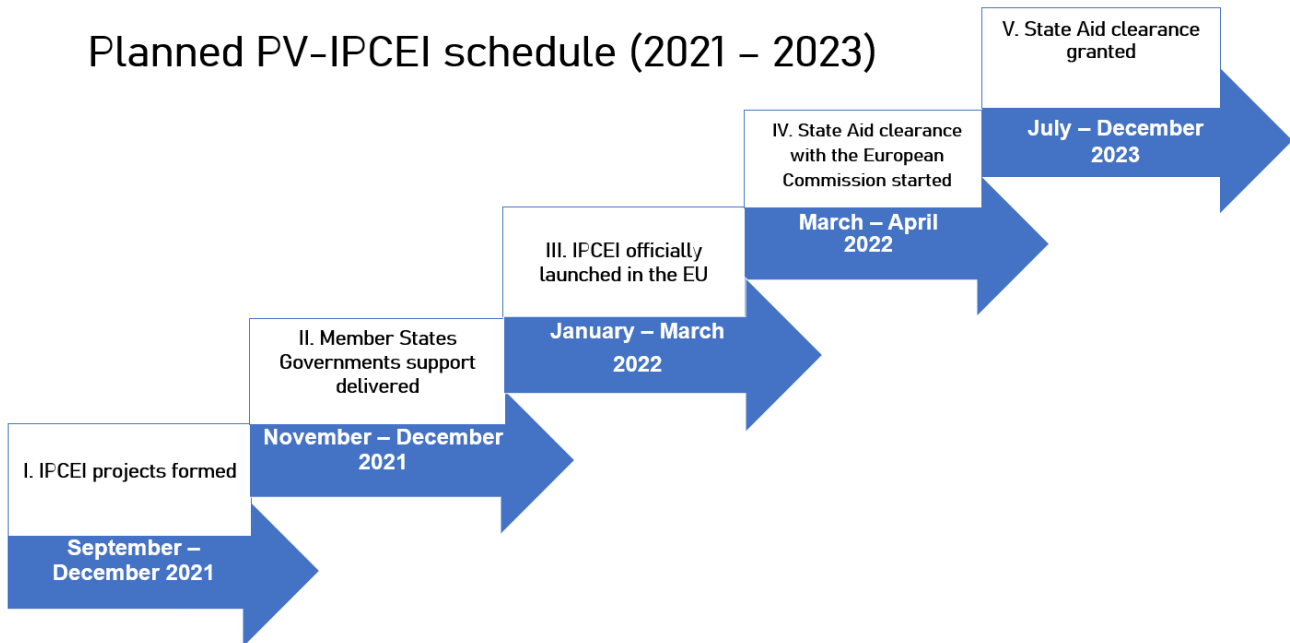
Currently, these 5 projects initiated under the PV IPCEI framework includes the following PV manufacturing innovations:

No.	Project title	Goals of the project
1.	Industrializing Heterojunction Cell and Module Technology to the Gigawatt Scale while manufacturing high performance Heterojunction solar cells	Establish within the next 7 years, 15 Gigawatt (GW) of PV cell and module manufacturing in Europe, on the basis of the highly efficient Heterojunction Technology (HJT). The first stage of the project will be the implementation of innovative HJT PV cell and module manufacturing pilot lines during 2022.
2.	Manufacturing of TOPCon PV cells and silver paste with optimised silver contacts	Extend the European PV value chain by local manufacturing of silver paste and novel PV cells. The innovation will focus on reduction of cost of silver contacts on silicon TOPCon cells, without compromising the advantages of the technology.
3.	Industrializing Tandem PV technology to the Gigawatt scale	To bring Tandem Silicon-Perovskite PV technology at industrial maturity and Gigawatt scale production establishing a production of 3 GW of PV cells and modules in Europe. Tandem technology will allow to overcome Silicon cell power efficiency conversion exceeding 30% and to lower Levelized Cost of Energy.
4.	PV integrated solutions for buildings, infrastructure and various applications	Develop and establish large-scale Europe based production of innovative integrated PV solutions. For applications in buildings (BIPV), infrastructure (IIPV), vehicles (VIPV) and agriculture (Agro-PV).
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1. Industrializing heterojunction cell and module technology to the Gigawatt scale (28 Members)	
2. Manufacturing of TOPCon PV cells and silver paste (12 Members)	
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The PV IPCEI framework has been initiated and started to be established in July 2021. Although the IPCEI process is rather complex the following vision has been confirmed to finalize the State aid procedures in 2023. Close cooperation among the PV IPCEI partners and participating Member States and their early involvement in the process is one of the key factors for the successful confirmation of the IPCEI status for PV industry and the implementation of the foreseen projects. The proposed projects are being formed currently – accordingly there are all the possibilities to include the new projects or adapt the ongoing projects in line with the views of joining Member States and partners.

Planned PV-IPCEI schedule (2021 – 2023)



II) IMPORTANT PROJECT OF COMMON EUROPEAN INTEREST – BENEFITS FOR THE PARTICIPANTS

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- **Safeguarded commitment of the Member States on financing.** During the notification process, Member States should commit to certain concrete levels of financial support, to be dedicated to the specific IPCEI topic and to concrete projects within the Member State.
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III. WHY THE IPCEI ON PV INNOVATION AND MANUFACTURING IS MORE REALISTIC NOW THAN EVER BEFORE?

- **The European Commission is currently reviewing the IPCEI guidelines** with a targeted vision to (a) simplify the rules of IPCEI adoption, (b) to expand its applicability to small and medium-sized enterprises and (c) to enhance IPCEI consistency with EU policies, enabling green and digital transformation.
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V. EXAMPLES OF IPCEIs:

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 - **Microelectronics (2018-2024)** — 4 Member States and 29 companies participating, €1.75 billion funding approved, expected an additional €6 billion in private investment. Average dedicated support is €438 million per country.
 - **Microelectronics and Communication Technologies** – 20 Member States and more than 90 companies participating, ongoing process, pre-notification with expected more than €10 billion investments started on December 2021.
 - **Hydrogen** — 22 Member States and Norway participating, ongoing process, match-making procedure under development.
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