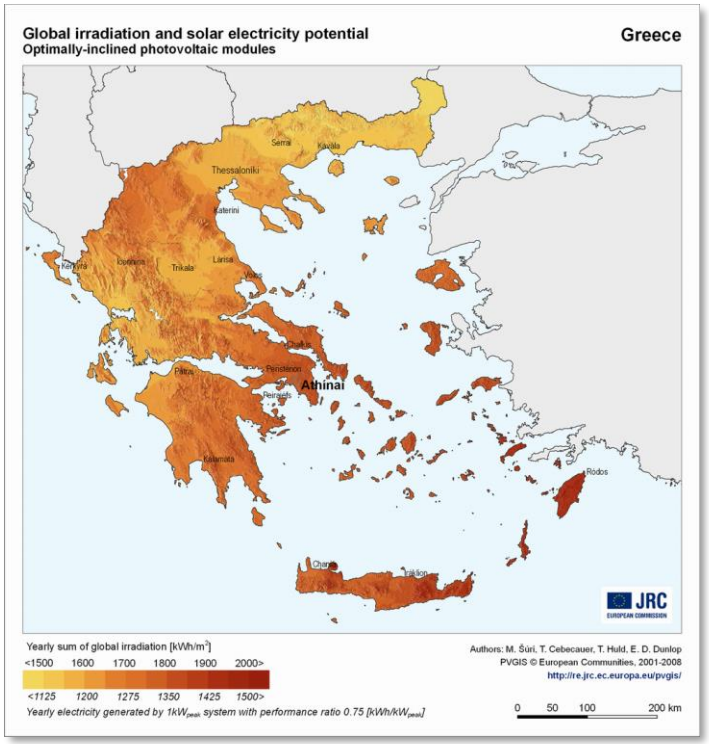
THE VOICE OF RENEWABLES
RENEWABLE GREECE
14-15 APRIL 2022, ATHENS

The Voice of Renewables GREECE



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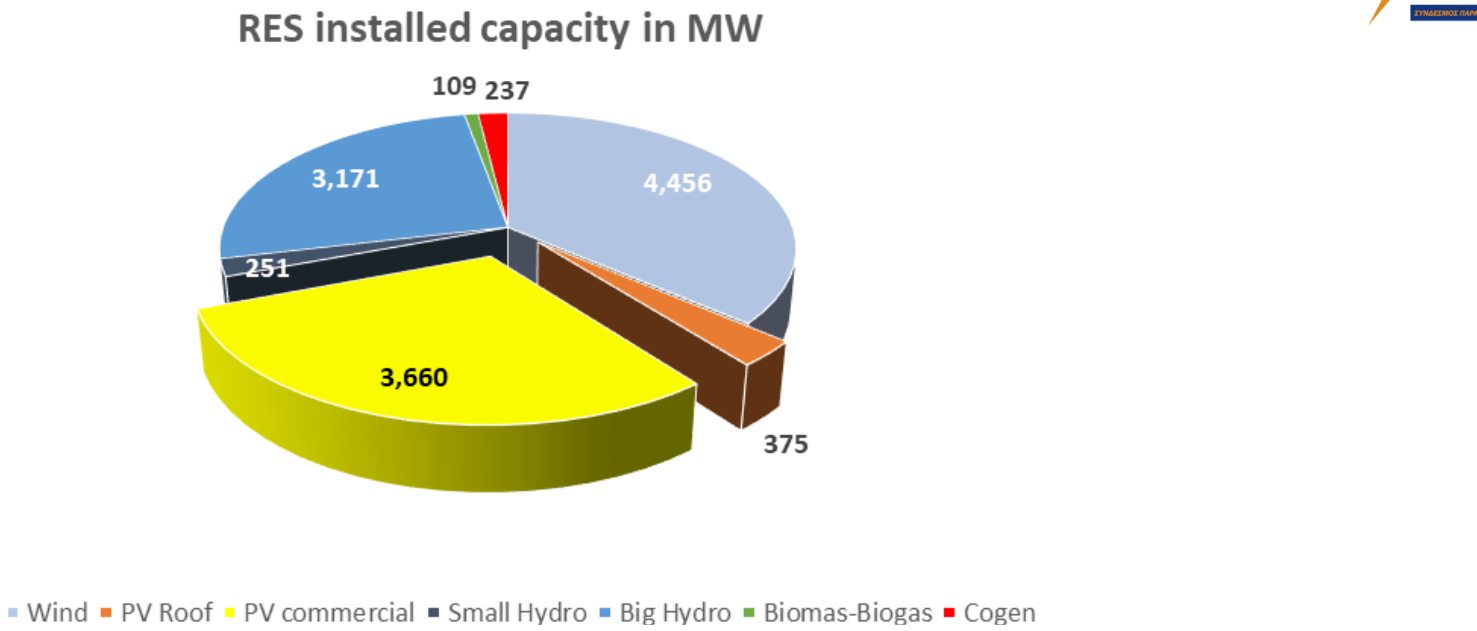
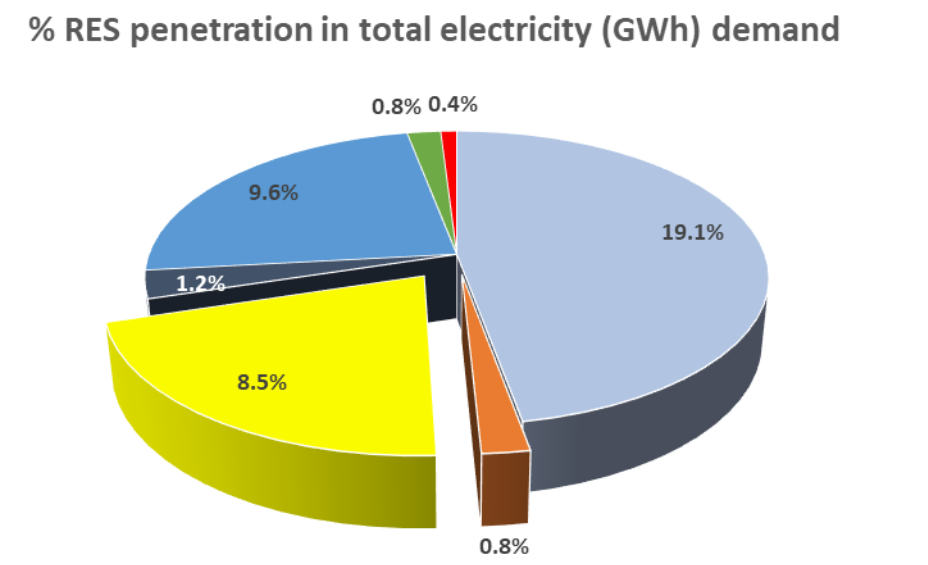
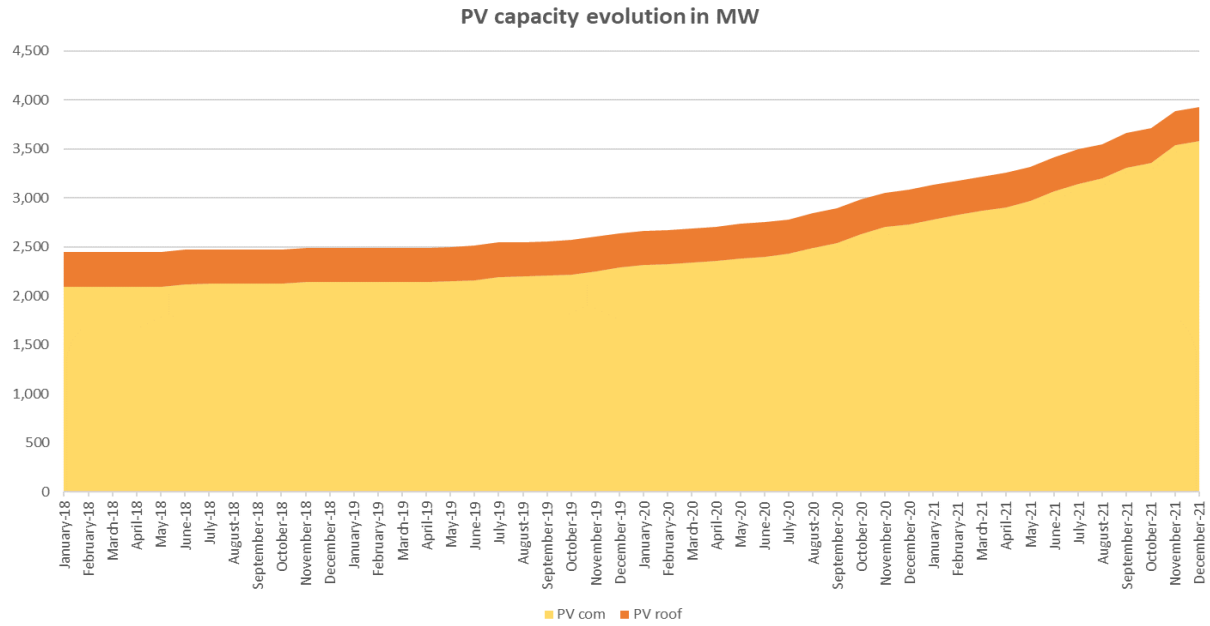
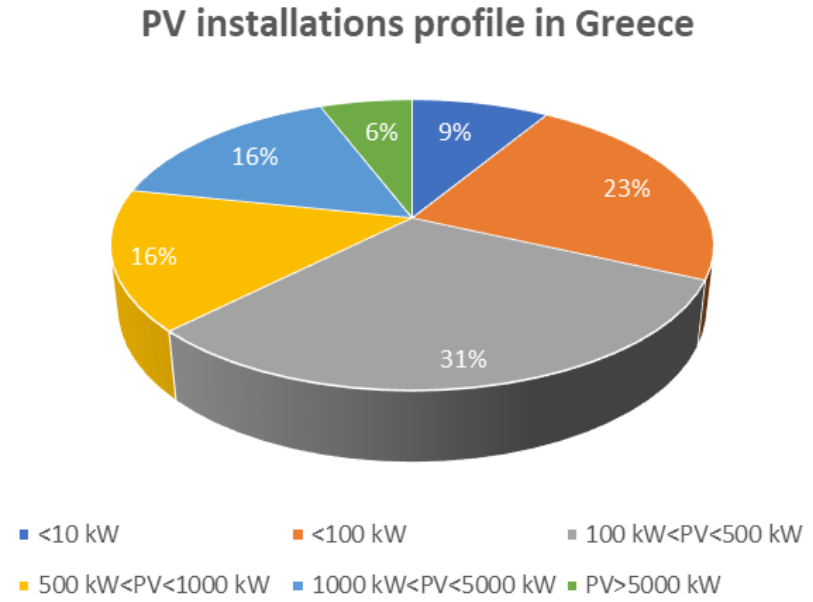
RES penetration in Greece (2021)





Evolution and Profile of PV installations in Greece (end 2021)





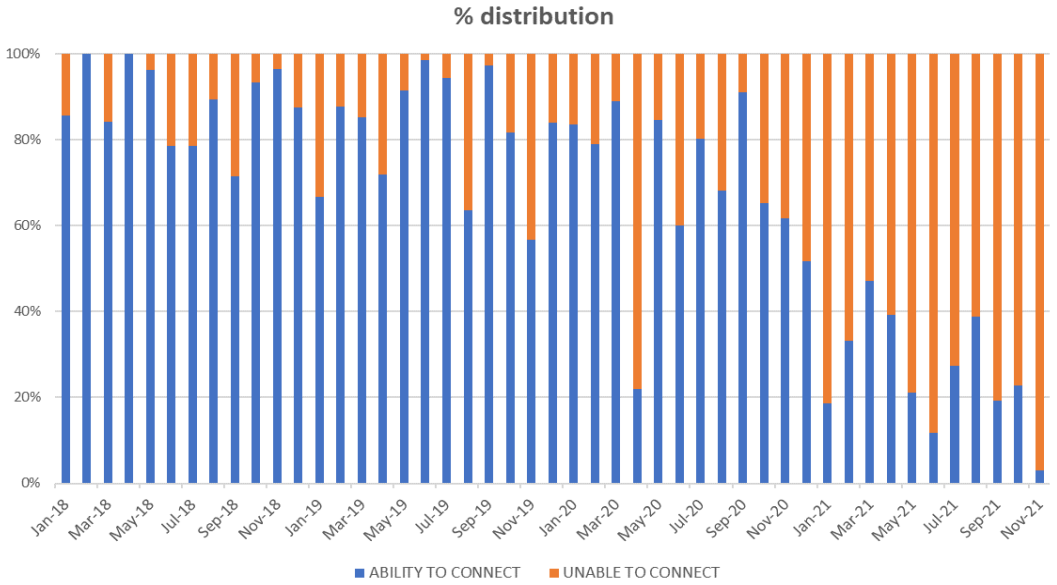
PV market was stagnating. It restarted in 2019

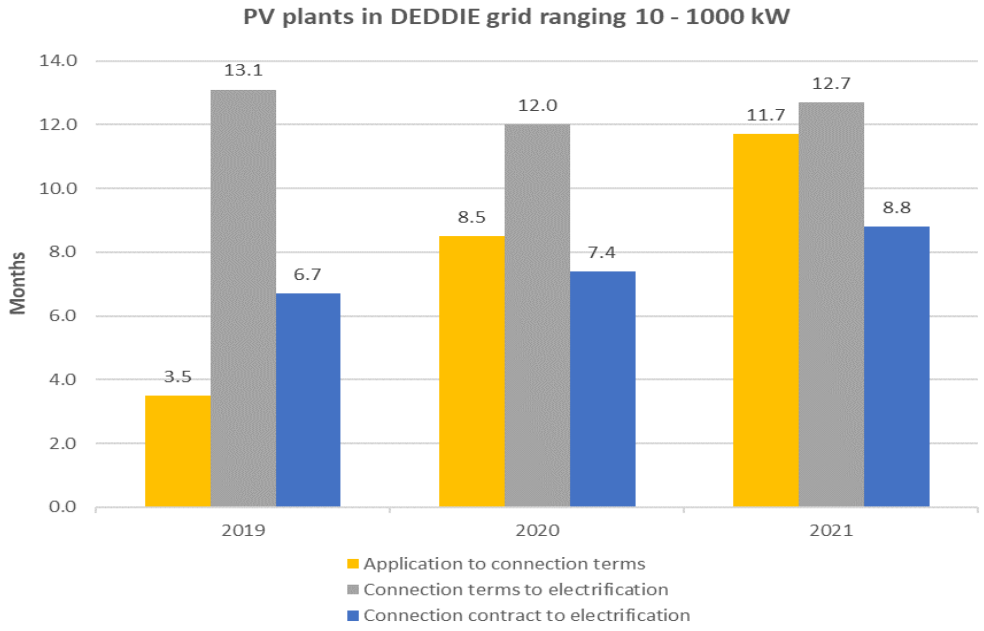
The 2030 target according to current NECP is 7,7 GW.

It is expected to exceed 10 GW at the revised plan.

Since this capacity is higher than most of the demand peaks, it will need storage units to avoid significant curtailments in the new PV plants.

Grid saturation limits the potential for new PV installations





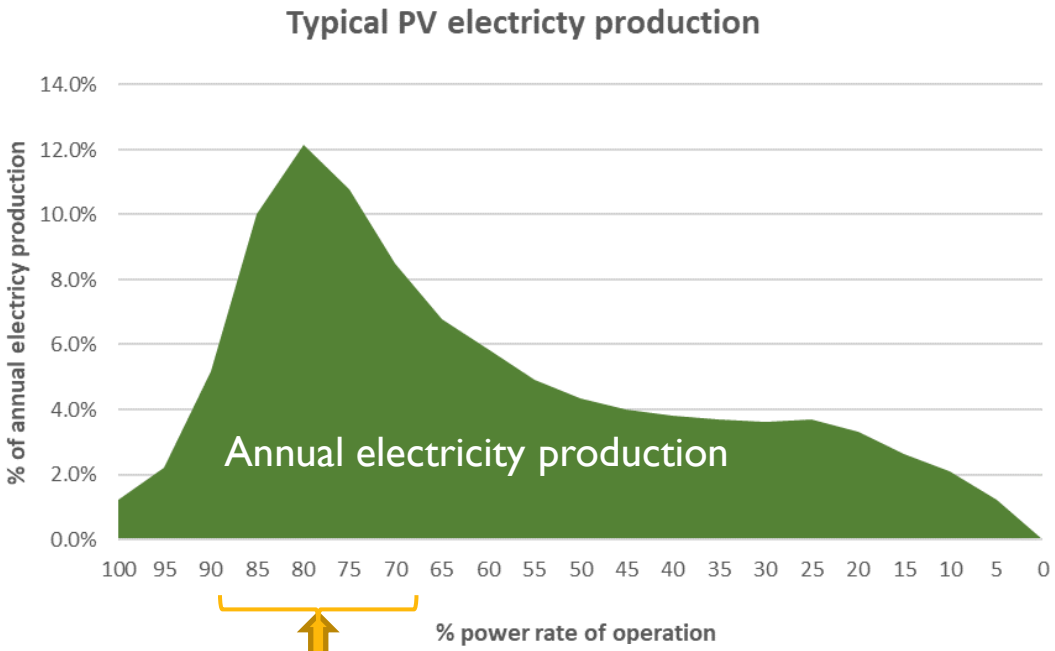
Grid saturation has become the ultimate obstacle for further PV penetration.

According to official DEDDIE published data, processed by SPEF, new applications to DEDDIE for connection terms receive negative answer at almost 90% of the cases.

DEDDIE Connection Terms (if any) need 11.7 months to be issued from application, according with officially published raw data.

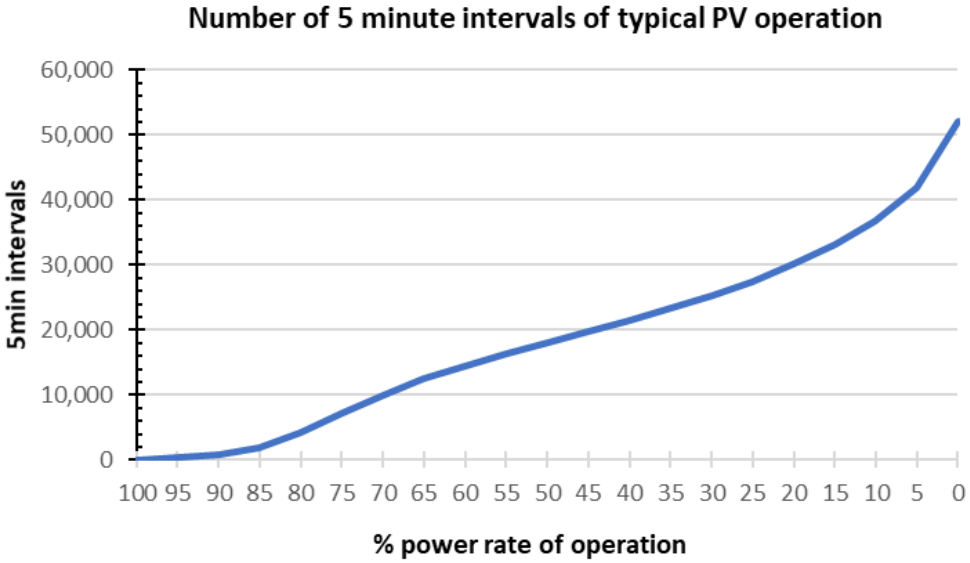
For ADMIE, Connection Terms pipeline and lead times, there are no officially published raw data available.

PV electricity production distribution Vs operation % rate

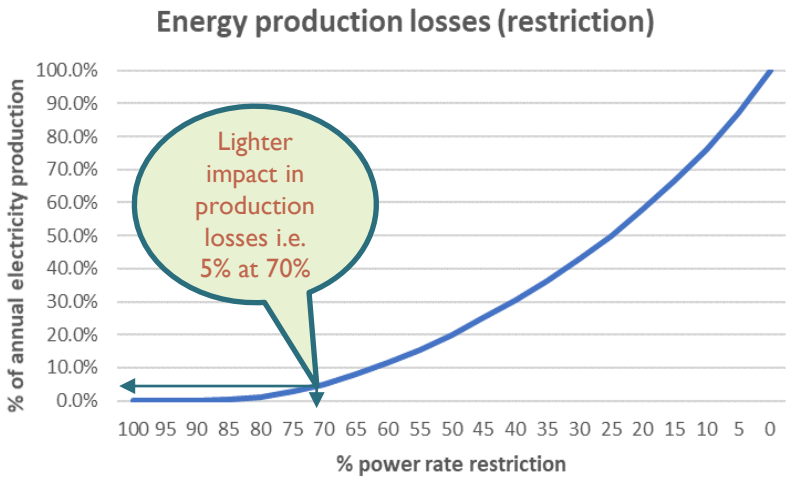


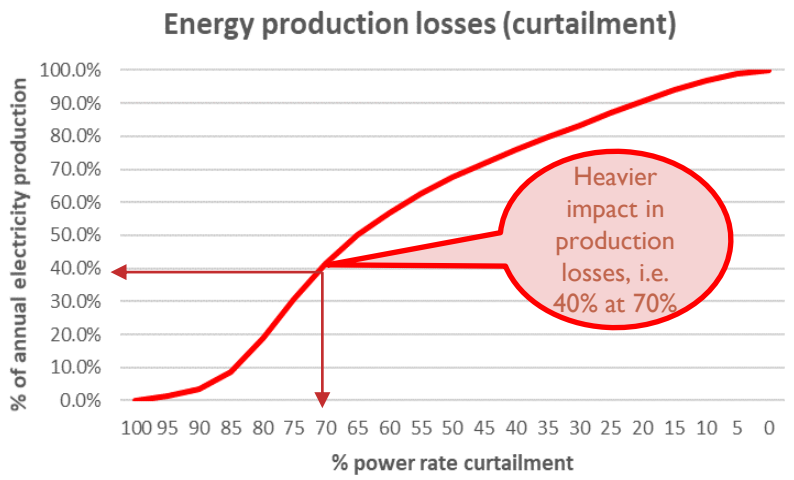
Most of annual electricity production of a typical PV plant*.

*Typical PV plant means fixed basis, 25° inclination and 1,500 MWh/MW specific annual production



Energy production losses Vs % power rate restriction or curtailment in a typical PV plant





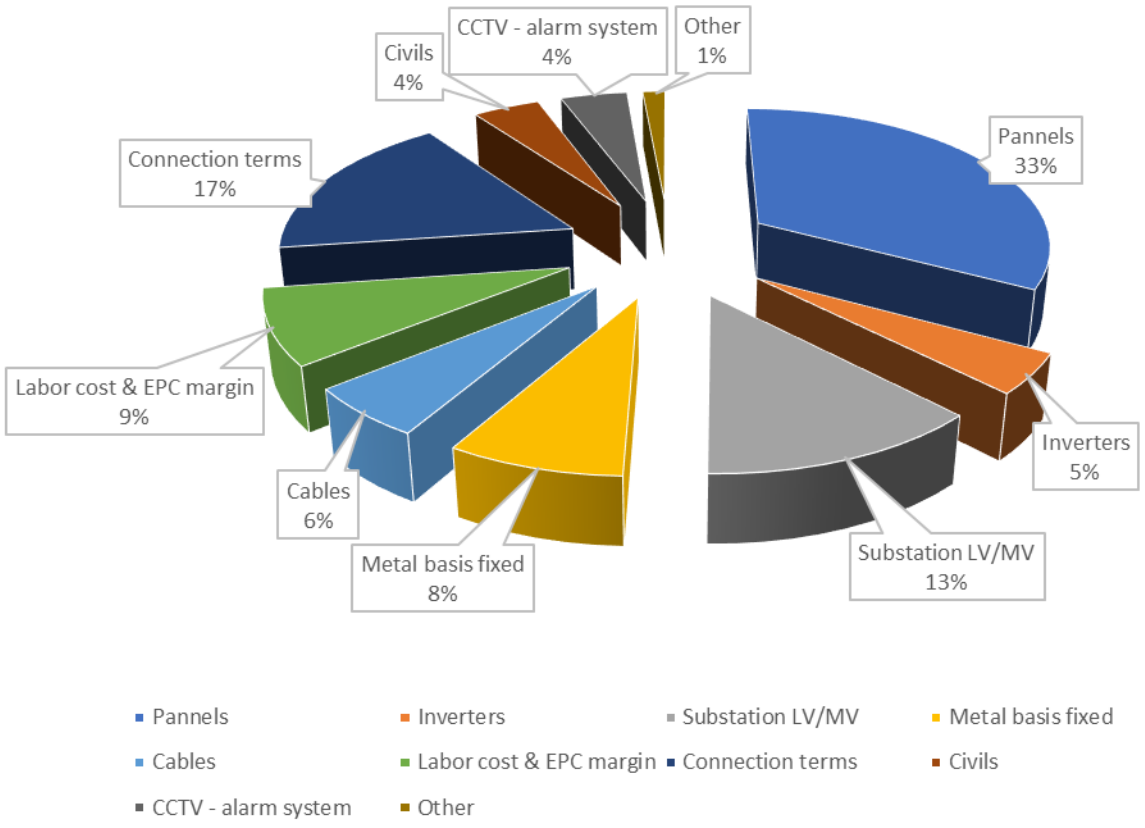
The Ministry of Energy aiming to fully exploit electrical space in the grids, will introduce -only for new connection terms and connection contracts issued from now and on- a mechanism for restricting or curtailing their operation in cases of congestion. Annual energy losses will be kept up to 5%.

% Power rate restriction scenario (left chart) means that under specific conditions of congestion in the grid, the grid administrator limits PV plant's operation up to a specific level of its power rate. However, the plant continues to operate, as it is not disconnected from the grid.

% Power rate curtailment scenario (right chart) means that under specific conditions of congestion in the grid, the grid administrator fully stops PV plant's operation at a specific level of its power rate, namely through disconnecting it.

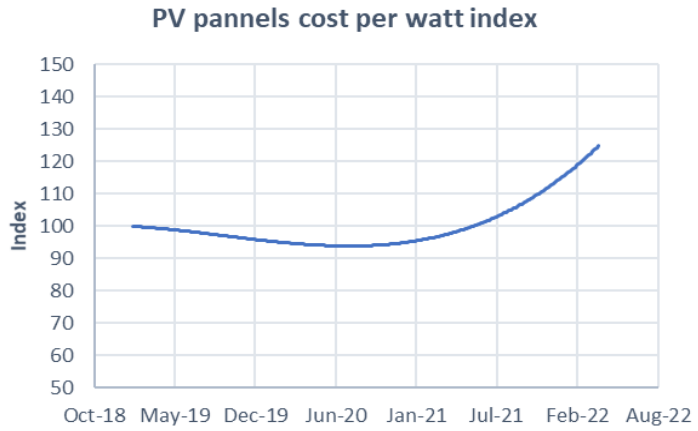
The question that remains is how and when such a mechanism will be technically available and what will happen until then.

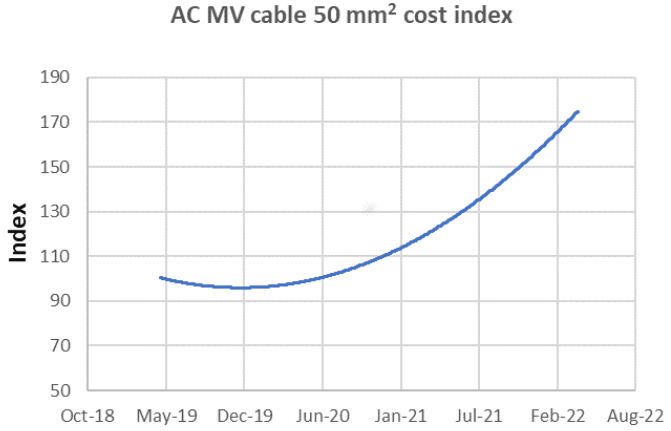
Construction cost center distribution for a typical 400 – 500 kW PV plant

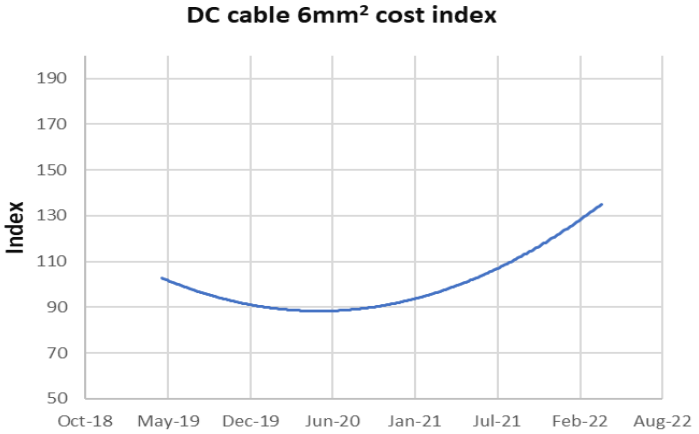


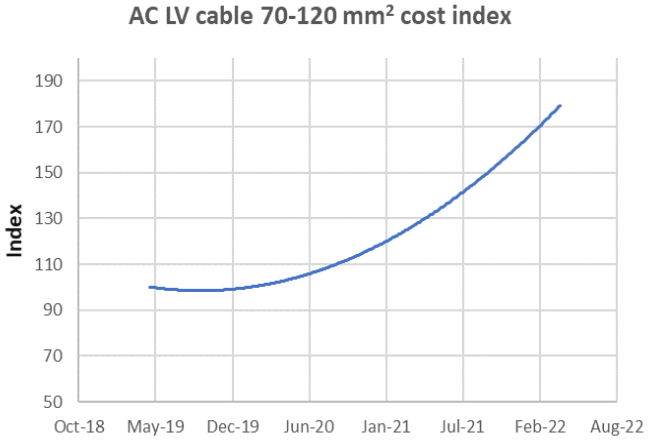
Average construction cost increase of a typical PV plant lays around 15-20% compared to 2020-2021, as can be seen in the following analysis per major cost center from real market data.

Cost increases (indexed) per cost center
-from real market data-









- PV Panel cost/watt has increased by 30% vs beginning of 2021
- AC cable cost has increased up to 80% and DC cable cost up to 25%
- LV/MV Substation cost has increased by 20%
- DEDDIE Connection Terms have doubled their cost in most of the cases
- Steel cost increase eliminated cost saving in metal bases due to reduced number of panels
- There is no sign for cost reduction in the near future.

Priorities and challenges for further PV growth in Greece - 1

- PV growth should continue balanced between vertical participants (combining production and retail) and non vertical (only electricity production) of all sizes.
- Vertical participants do not need DAPEEP PPAs. They can easily sell their production to themselves, aiming to cover just a part of their retail needs.
- Vertical participants also enjoy the opportunity of acquiring windfall profits for their RES production, out of DAPEEP or private PPAs, since their retail prices are mainly based on marginal gas fired plants and/or wholesale market prices that reflect them.
- Non vertical PV electricity producers offer cost transparency for their production and do not have the opportunity for windfall profits. Their projects are not bankable out of a PPA. Moreover, through PPAs they truly reduce the cost of electricity overall for the consumer and secure funds in ELAPE for financing consumer bills' subsidies.
- Non-vertical PV producers remain vulnerable against vertical participants in RAE auctions for a 20-year PPA, despite law 4843 and the provision for a 4-year penalty, if abandon it earlier. Tariff reductions in RAE auctions despite the increase in construction costs are not a healthy symptom and will not lead to reductions in consumer bills.
- Cost increases for PV plants amounting 15-20% compared to end 2020 – beg 2021 period, pause significant challenges for healthy further growth for non vertical participants, that "desperately" need PPAs for financing and building their projects.
- Administratively determined PV tariffs (out of RAE auctions) can not be further reduced compared to current levels (65,74 euros/MWh) until building cost reductions really take place. Administrative PV tariffs might also increase for private projects and equate at least with the tariffs for Energy Communities.

Priorities and challenges for further PV growth in Greece - 2

- Recent, law 4903/2022, increases in administratively determined Wind tariffs for new projects up to 6 MW (instead of 3 MW before) to 89 euros/MWh instead of 72 euros/MWh before, showed a true path for keeping new RES production healthy. Such a revision should be examined for PVs as well.
- Peloponnese opening of law 4819/2021 for private PV projects up to 400 kW should take place as soon as possible. Surplus applications (even beyond the limit of 200% of the initial quota of 86 MW) should not be returned to investors but kept by DEDDIE for future evaluation under the 5-year context, that is valid all over the country.
- The deadline of 31/12/22 for signing SEST contracts with DAPEEP does not make sense and should be lifted. Investors, under specific conditions, are allowed to file applications to DEDDIE during 2022 for new SEST projects. However, as DEDDIE needs ~12 months for issuing connection terms (if any…), it is impossible for investors to meet the deadline of 31/12/22 with DAPEEP for signing SEST.
- Virtual net metering in Energy Communities should cover electricity consumption of common areas of a building as well, in cases where all residents of the building are members of the community. Common areas in a building consist an “installation” of the members of a community, so there is no problem with law 4513/2018 definitions.
- In such virtual net metering Energy Communities, fees should be lifted and accounting (book keeping) obligations should be relaxed or even removed.

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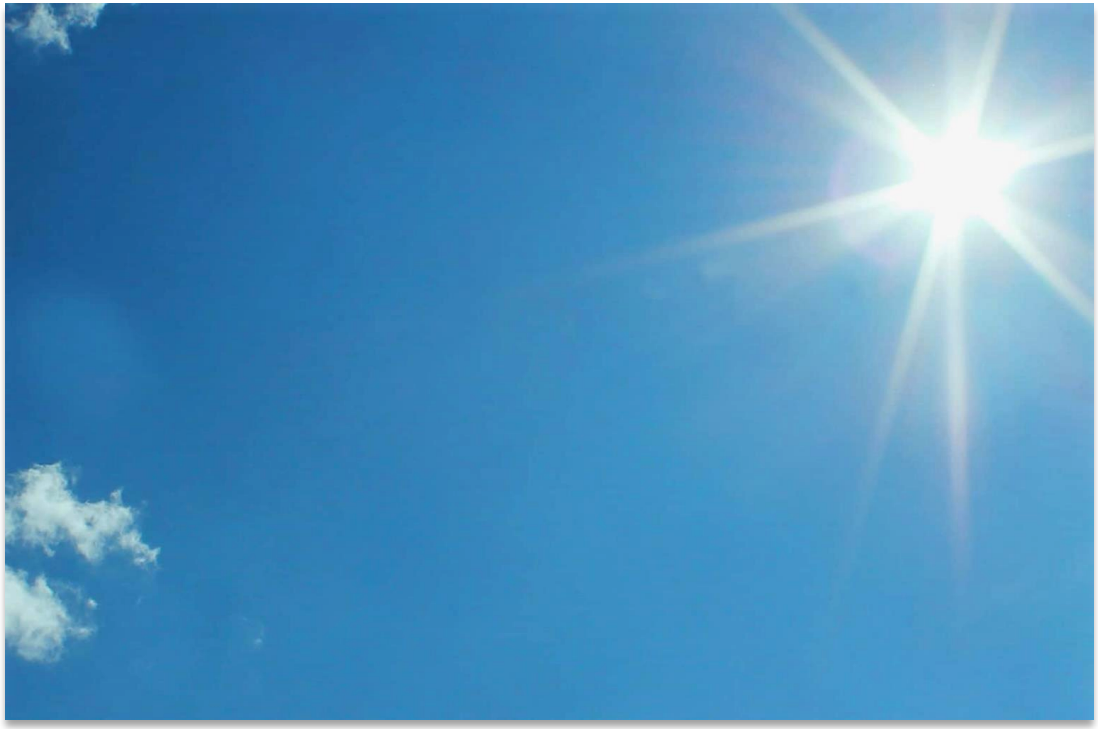
ΣΥΝΔΕΣΜΟΣ ΠΑΡΑΓΩΓΩΝ ΕΝΕΡΓΕΙΑΣ με ΦΩΤΟΒΟΛΤΑΪΚΑ



THANK YOU !