

The role of agrivoltaics in energy system transitions

Jan Krčmář

Executive Director

Czech Solar Association

International multidisciplinary discussion seminar

November 2023



PV IN CZECHIA: RECORD ACCELERATION

289 MWp

total added capacity in 2022

487 MWp

total added capacity in 2023H1

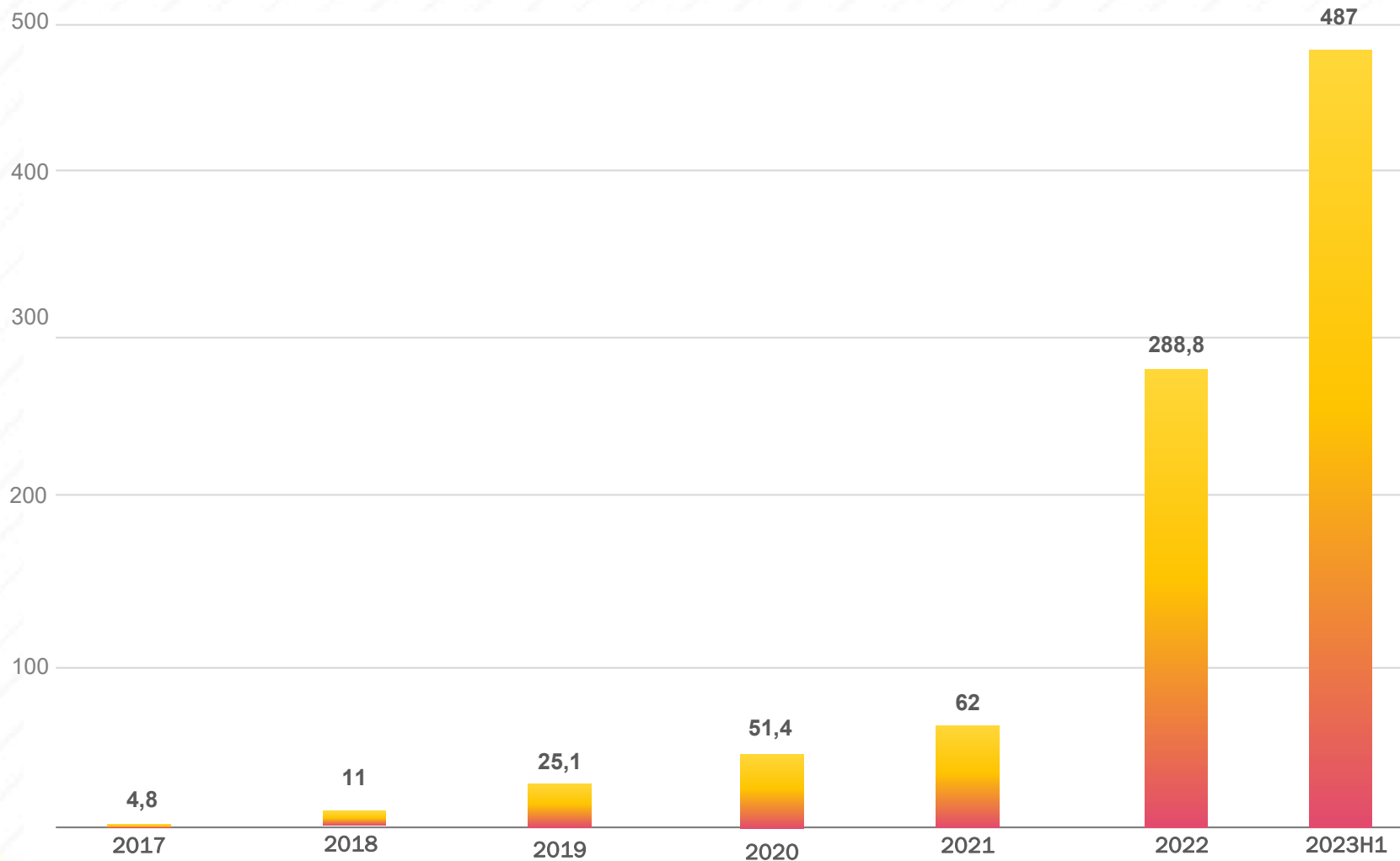
33 760

number of power plants commissioned in 2022

45 197

number of power plants commissioned in 2023H1

OFF THE CHARTS. LITERALLY.



STILL LAGGING BEHIND

Czech PV market is still growing slower than in other countries



REASONS TO BE CHEERFUL



Heavily industrialised country: large electricity demand

Modernisation fund: billions of EUR available

RES+



Large amount of (future) brownfields available

Energy sector will need to be decarbonised



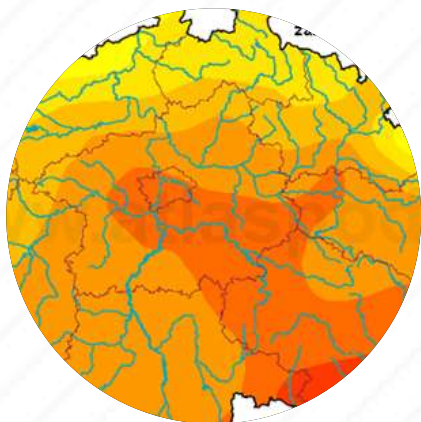
REASONS TO BE FEARFUL



Barriers might not be removed quickly enough: not enough energy by 2030.



Storage might not be used effectively resulting in solar not being commercially viable.



Go-To-Zones might turn out to be blocked by local politicians.



Economy will be impacted negatively: without energy from RES companies might leave Czechia.

WHAT IS AGRO-PV?

Agrivoltaics,
Agrophotovoltaics,
AgriPV, APV?



Dual use of land?

PV with orchards, vineyards,
vegetable, sheeps?

Synergy between agriculture and
electricity production

MAIN REASONS FOR AGRO-PV?

Three main ideas of agrivoltaics...



Protection against
Climate change threat



Installation for own
consumption of electricity



Dual use of land

MAIN REASONS FOR AGRO-PV?

Protection against climate change threat



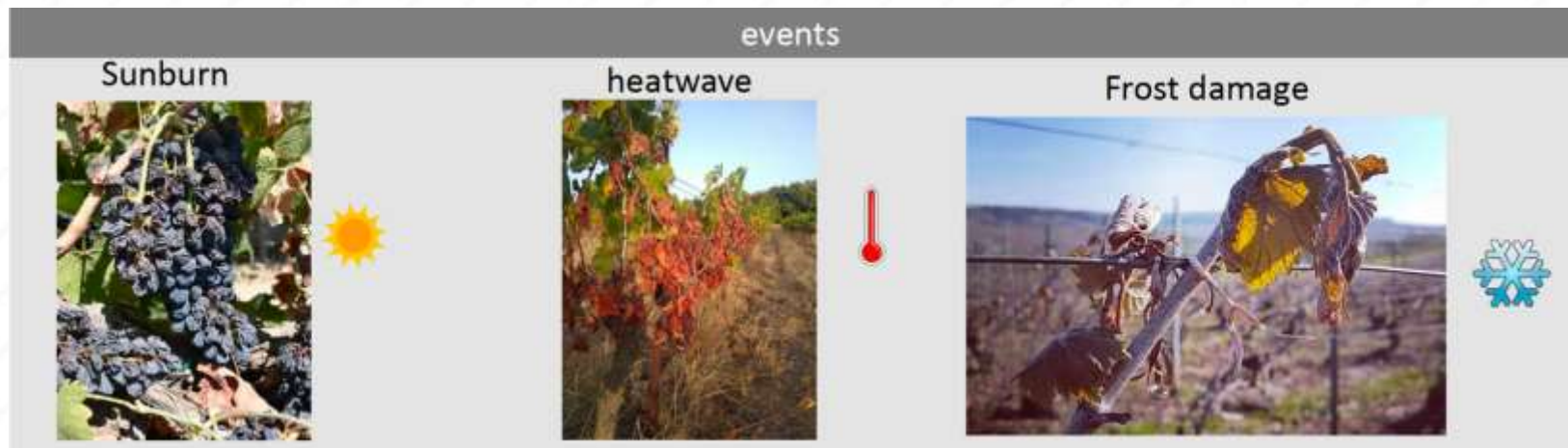
Example:
Winery in Perpignan, South of France

- The panels absorb sunlight and cool the plants and soil below
- Shading saves water for irrigation
- Working with plants and root systems, it can help stop water erosion - buffer strips
- Physical protection of crops from heavy rain/hail
- Protection against damage from strong direct sunlight
- Protection against spring frosts and high temperatures



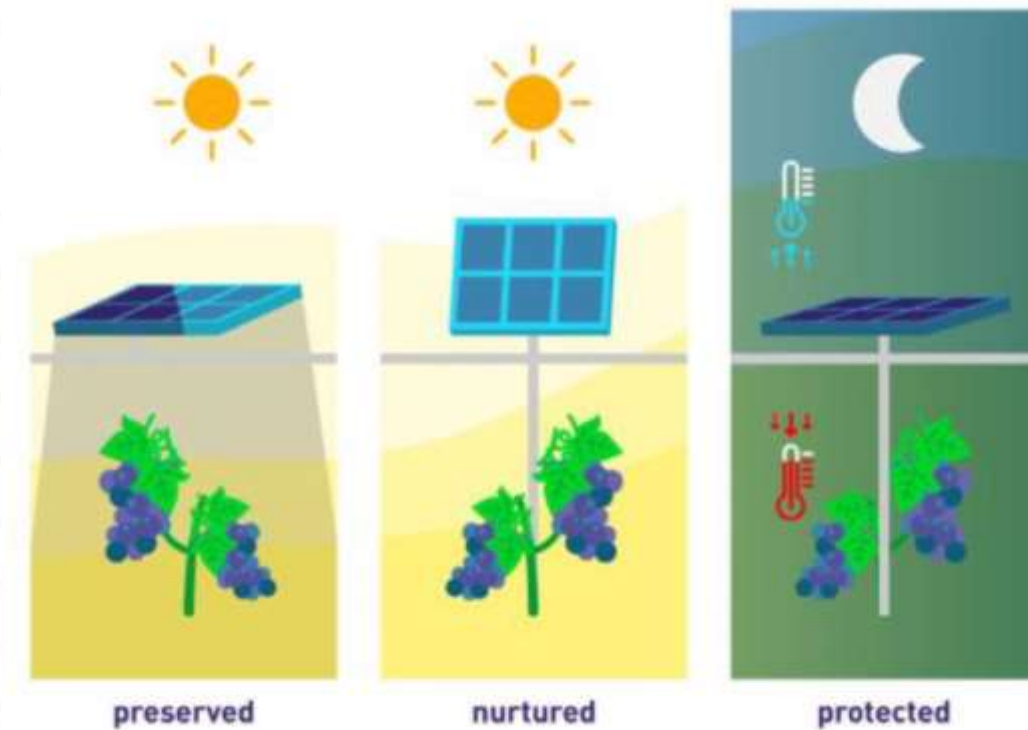
MAIN REASONS FOR AGRO-PV?

Protection against climate change threat



MAIN REASONS FOR AGRO-PV?

Protection against climate change threat



MAIN REASONS FOR AGRO-PV?

Protection against climate change threat



Example:
Winery in Perpignan, South of France

Example: Perpignan, France (2022)

- The panels shade the fruits
- Shading slows down the injury process, less sugar, less alcohol, better taste
- Power generation is secondary
- The so-called "trackers" are managed by agronomists, not energy experts
- In the Czech Republic, this model may not work economically yet



MAIN REASONS FOR AGRO-PV?

Installation for own consumption of electricity



Example:
agriculture company, Pöchlarn, Austria

- Many agricultural buildings or factories do not have suitable roofs
- Production from roofs would often not cover consumption (e.g. orchards, greenhouses)
- Consumption at the point of production reduces energy costs
- Another source of income for farmers
- Decarbonization of agriculture
- Typically several hectares in size



MAIN REASONS FOR AGRO-PV?

Installation for own consumption of electricity



Example:
fruit production company, Lierop, Netherlands

Example: Lierop, Netherlands (2022)

- Already existing, large rooftop PV installation (in the order of MW)
- It will not cover the energy consumption for cooling the fruit
- Agrovoltaic plant above crops that prefer shade (raspberries)



MAIN REASONS FOR AGRO-PV?

Installation for own consumption of electricity



Example:
agriculture company, Pöchlarn, Austria

Example: Pöchlarn, Austria (2023)

- Production of fodder for animal breeding
- Potential of roofs: 0-20 kWp
- Huge cost (silo)
- Consumption: 6 MW
- Power of the agrovoltaic system: 5 MWp
- Type: TTP, sheep + experimental installation



MAIN REASONS FOR AGRO-PV?

Dual use of land



Example:
vertical construction, Vienna, Austria

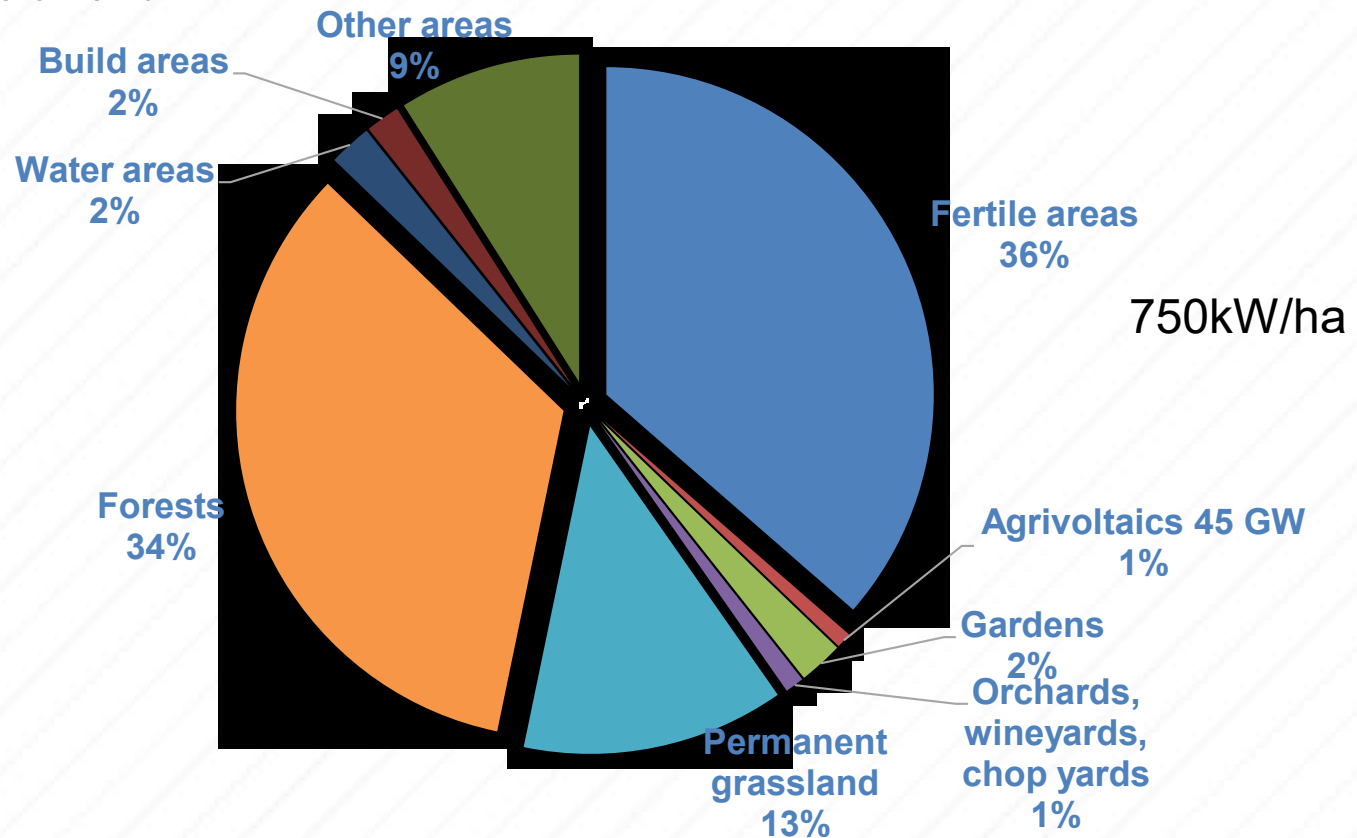
- It allows the installation of larger PV parks without losing agricultural land
- The production of rooftop PV systems in the Czech Republic will not even cover consumption
- The need to build land-based power plants
- Factories, logistics centers, and halls are supposed to be located on brownfields
-

Without large ground installations, we will not be competitive. Agrovoltatics enable gentle production without soil loss.



MAIN REASONS FOR AGRO-PV?

Dual use of land



No rooftop instalation at all

Protection against climate change threat



Installation for own consumption electricity

TYPES OF AGRIVOLTAICS

According to crops under or between them...



High construction installations
(fruits)
Orientation: eas-west



Low horizontal construction
(pastures, permanent grassland)
Orientation: South




Vertical installation
(cereals, vegetable, etc.)
Orientation: eas-west

AGRI-PV IN CZECH LAW

On the verge of passing a genuinely good legal framework




Vláda České republiky

Ministerstvo životního prostředí
Č.j.: MZP/2023/280/314

V Praze dne
Výtisk č.: [redacted]

PRO SCHŮZI VLÁDY

Návrh zákona, kterým se mění zákon č. 334/1992 Sb., o ochraně zemědělského půdního fondu, ve znění pozdějších předpisů

Důvod předložení:
Podle Plánu legislativních prací vlády na rok 2023

Obsah:
I. Návrh usnesení
II. Předkládací zpráva
III. Návrh zákona
IV. Důvodová zpráva
V. Platné znění s vyznačením navrhovaných změn
VI. Závěrečná zpráva z hodnocení dopadů regulace
VII. Teze prováděcího právního předpisu
VIII. Tabulka vypořádání připomínek

Předkládá:
Mgr. Petr Hladík
ministr životního prostředí

- Amendment to Act 334/1992 Coll. on the protection of the agricultural land fund
- Passed by government in October 2023, now in parliament
- Agrivoltaics without removal from the agricultural land fund
- Supplemented by secondary regulation
- Limited crops – Vineyards, chop yards, orchards
- As of 07/2024
- Technical parameters inspired by DINSPEC 91434

BARRIERS

Zoning plans and building permits as a potential barrier



Jan Krčmář

Executive director

E jan.krcmar@solarniasociace.cz

T +420 773 032 182

THANK YOU FOR YOUR ATTENTION!

