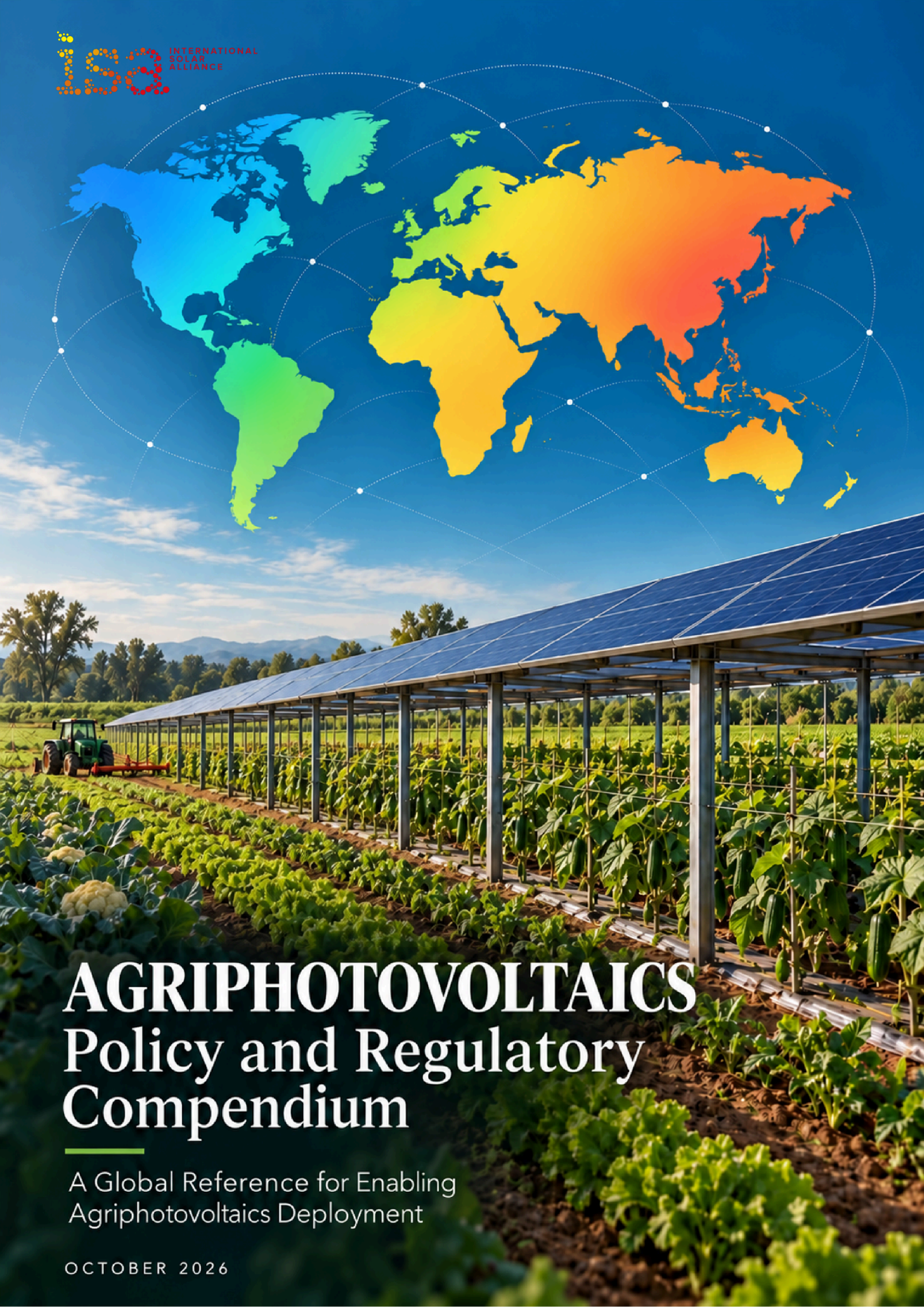




AGRIPHOTOVOLTAICS

Policy and Regulatory Compendium

A Global Reference for Enabling
Agriphotovoltaics Deployment

OCTOBER 2026



Agriphotovoltaics Policy & Regulatory Compendium

A country-level review of agriphotovoltaics policy worldwide, to inform future frameworks in ISA Member Countries

October 2026 • (revised after external review)

AGRI PHOTOVOLTAICS POLICY AND REGULATORY COMPENDIUM

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Abbreviations

Acronyms and abbreviations used across the compendium

ADB	Asian Development Bank
ADEME	French Agency for Ecological Transition
ALRO	Agricultural Land Reform Office (Thailand)
AMADER	Rural electrification agency (Mali)
AMAPV	Alliance for Modern Agricultural PV Industry (China)
ANEEL	National Electric Energy Agency (Brazil)
ANME	National Agency for Energy Management (Tunisia)
APER	Renewable energy acceleration law (France)
APV	Agri-photovoltaics (agriphotovoltaics)
APV-MaGa	Agriphotovoltaics project in Mali and The Gambia
APV-RESOLA	Fraunhofer ISE pilot at Heggelbach (Germany)
AT2ER	Rural electrification agency (Togo)
BauGB	Federal Building Code (Germany)
BGBI.	Federal Law Gazette (Germany, Austria)
BMWET	Ministry of Economy, Energy and Tourism (Austria)
BOE	Official State Gazette (Spain)
BStBI	Federal Tax Gazette (Germany)
CAG	Comptroller and Auditor General of India
CAP	Common Agricultural Policy (EU)
CASE	Clean, Affordable and Secure Energy (Southeast Asia)
CBDT	Central Board of Direct Taxes (India)
CIAT	International Center for Tropical Agriculture
CNE	National Energy Commission (Dominican Republic)
CRE	Energy Regulatory Commission (France)
CTCN	Climate Technology Centre and Network
CZK	Czech koruna
DACC	Climate action and agriculture department (Catalonia)
DAPEEP	Renewable energy sources operator (Greece)
DFFE	Forestry, fisheries and environment dept. (South Africa)
DIN SPEC	German Institute for Standardisation specification
DISCOM	Electricity distribution company (India)
DM	Ministerial Decree (Italy)
DOER	Department of Energy Resources (Massachusetts)
DRC	Development and Reform Commission (China)
EABG	Renewable Expansion Acceleration Act (Austria)
EAG	Renewable Expansion Act (Austria)
EC	European Commission
EEG	Renewable Energy Sources Act (Germany)
EU	European Union
EUR	Euro

FER	Renewable energy support decrees (Italy)
FIAP	Ibero-American public administration foundation
FIP	Feed-in premium
FIT, FIT	Feed-in tariff
FPO	Farmer producer organisation
FY	Financial or fiscal year
GAPDZV	CAP Direct Payments Ordinance (Germany)
GGGI	Global Green Growth Institute
GIS	Geographic information system
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GSE	Energy Services Operator (Italy)
GW, GWh	Gigawatt / gigawatt-hour
HEDNO	Hellenic Electricity Distribution Network Operator
ICAR-CAZRI	ICAR Central Arid Zone Research Institute (India)
ICRIER	Indian Council for Research on International Economic Relations
IEA PVPS	International Energy Agency Photovoltaic Power Systems Programme
IFAD	International Fund for Agricultural Development
IKI	International Climate Initiative (Germany)
ILS	Israeli new shekel
INR	Indian rupee
InSPIRE	NREL agriphotovoltaics research programme (United States)
IRENA	International Renewable Energy Agency
ISA	International Solar Alliance
ISE	Fraunhofer Institute for Solar Energy Systems
JET-AgrISO	Just-transition agriphotovoltaics programme (Colombia)
JORF	Official Journal of the French Republic
JPS	Jamaica Public Service Company
JPY	Japanese yen
kW, kWh, kWp	Kilowatt / kilowatt-hour / kilowatt-peak
LAC	Latin America and the Caribbean
LAOR	Land area occupation ratio (Italy)
LPIS	Land Parcel Identification System
MAE	Ministry of Agriculture and Environment (Vietnam)
MAFF	Ministry of Agriculture, Forestry and Fisheries (Japan)
MAFRA	Ministry of Agriculture, Food and Rural Affairs (Korea)
MASE	Ministry of Environment and Energy Security (Italy)
METI	Ministry of Economy, Trade and Industry (Japan)
MINAGRI	Ministry of Agriculture and Animal Resources (Rwanda)
MITE	Ministry of Ecological Transition (Italy, now MASE)
MNRE	Ministry of New and Renewable Energy (India)

MSDE	Ministry of Skill Development and Entrepreneurship
MW, MWh, MWp	Megawatt / megawatt-hour / megawatt-peak
NAWEC	National Water and Electricity Company (The Gambia)
NISE	National Institute of Solar Energy (India)
NOP (TAMA)	National Outline Plan (Israel)
NOVI	National Environment and Planning Vision (Netherlands)
NREL	National Renewable Energy Laboratory (US)
NSW	New South Wales (Australia)
O&M	Operation and maintenance
PIB	Press Information Bureau (India)
PM-KUSUM	PM Kisan Urja Suraksha evam Utthaan Mahabhiyan
PMFBY	PM Fasal Bima Yojana, crop insurance (India)
PMGD	Small distributed generation regime (Chile)
PNRR	National Recovery and Resilience Plan (Italy)
PPA	Power purchase agreement
PV	Photovoltaic(s)
RAB	Rwanda Agriculture and Animal Resources Board
RD	Royal Decree (Spain)
REC	Renewable energy certificate
REER	Renewable energy auction regime (Spain)
REIPPPP	Renewable energy procurement programme (South Africa)
RES	Renewable energy sources
RRF	Recovery and Resilience Facility (EU)
RVO	Netherlands Enterprise Agency
SAPVIA	South African Photovoltaic Industry Association
SDE++	Renewable energy subsidy scheme (Netherlands)
SFOC	Solutions for Our Climate (South Korea)
SFŽP	State Environmental Fund (Czechia)
SHG	Self-help group
SMART	Solar Massachusetts Renewable Target
TA	Technical assistance
TFZ	Technology and Support Centre (Bavaria)
UNU	United Nations University
US	United States
USD	US dollar
USM	Federico Santa María Technical University (Chile)
VGF	Viability gap funding
WRI	World Resources Institute

01

SECTION

Executive summary

Key findings, policy bottom line and how to use
the compendium

01 · EXECUTIVE SUMMARY

Executive summary

USD 6.2 bn

 Global agriphotovoltaics industry value, 2025¹
14+ GW

 Latest published global installed capacity estimate, 2021²
~31 GW

 China, 513 projects (2025), broader definition³
32

Countries profiled across four regions

Agriphotovoltaics has grown from a research concept into a global industry valued at about USD 6.2 billion in 2025¹. The latest published global estimate placed installed capacity above 14 GW in 2021², covering crop and livestock systems in which agricultural use continues. More expansive national assessments may also include solar greenhouses, aquaculture or fishery-PV, ecological-restoration projects and other PV-plus-agriculture models. These figures are therefore not directly comparable: China alone reported about 31 GW across 513 projects in 2025 using such a broader definition³. The pace has quickened: in 2026 alone, South Korea enacted one of the world's first dedicated national agriphotovoltaics acts⁴; Israel approved a dedicated national land-use plan for agriphotovoltaics⁵; and India announced a 10 GW agriphotovoltaics component for PM-KUSUM 2.0⁶.

This compendium profiles 32 countries across four regions (Europe, Asia-Pacific, Africa, Latin America and the Caribbean) and draws on EU-level and multilateral initiatives. Drawing on the frameworks reviewed (see methodology), it identifies recurring policy design choices and trade-offs and distils them into a model framework to support agriphotovoltaics development across ISA Member Countries. A recurring pattern in leading frameworks is to define agriphotovoltaics clearly, protect agricultural productivity and remove legal barriers before targeted financial support; this is a working hypothesis, as evidence for universal success factors is limited.

01

Policy vs market maturity

Policy maturity is not the same as deployment. Europe and parts of Asia-Pacific lead on dedicated rules. The United States and China lead on deployment with little or no dedicated national framework: about 600 US sites totalling roughly 10 GW, mostly sheep grazing and pollinator habitat⁷, and 513 Chinese projects totalling about 31 GW on a broad PV-plus-agriculture definition³. Africa, the Middle East and most of Latin America remain at pilot or feasibility stage on both counts.

02

Rules Before Incentives

Several frameworks set definitions, safeguards and monitoring early; where incentives came first (e.g. Japan), corrective rules followed. Evidence is case-based.

03

Model Framework

A ten-part template drawn from the frameworks reviewed: objectives, definition, legal basis, land use, permitting, incentives, monitoring, value-sharing, spatial planning and crop suitability.

04

Where ISA Can Help

Many ISA Member Countries face high food-energy-water pressure and have few or no dedicated agriphotovoltaics rules; a model framework is most useful there.

The bottom line

The reviewed frameworks suggest that treating farming as the principal land use, supported by clear definitions, measurable safeguards and bankable incentives, is a promising approach. Evidence remains context-specific. Safeguards must be balanced against bankability, as agricultural output is weather-dependent.

Sources: ¹ Research and Markets (Aug 2025), Agrivoltaics Market Size, Share, Trends, Analysis and Forecast 2025–2034; ² Fraunhofer ISE, Agrivoltaics: Opportunities for Agriculture and the Energy Transition (2nd ed., 2022); ³ WRI China (Sept 2025); ⁴ Korean Law Information Center, Act No. 21804 (passed 7 May 2026, in force 17 December 2026); ⁵ Israel Planning Administration, NOP 1, Amendment 24 (Feb 2026); ⁶ PIB release 2237890 (10 Mar 2026); ⁷ NREL InSPIRE (Nov 2024).

02

SECTION

Introduction

Purpose of the compendium, why frameworks matter, key regulatory challenges, and scope and methodology

02 • INTRODUCTION

Purpose of the compendium

Agriphotovoltaics, the shared use of the same land for crops or livestock and solar generation, has moved from research into practice and now features in renewable-energy plans on four continents.

In practice it means PV on agricultural land that stays in meaningful agricultural use; legal frameworks apply narrower eligibility criteria. When well-designed, it can raise land productivity, diversify farmer income, reduce heat and water stress, and create a lower-conflict pathway for solar deployment.

This compendium reviews the laws, regulations and incentives shaping agriphotovoltaics worldwide, country by country and distils the policy elements that can inform future frameworks in International Solar Alliance (ISA) Member Countries.

Where agriphotovoltaics has scaled, governments typically defined it, protected farming and bridged the cost and bankability gap; this compendium treats that pattern as a hypothesis and turns it into a model framework.



1981–82

Concept published by Goetzberger and Zastrow⁸; first 'solar sharing' trials by Akira Nagashima in Japan, 2004

14+ GW

Last published global estimate of agriphotovoltaic capacity, for 2021. Newer national counts (China, United States) are higher and use wider definitions.⁹

~31 GW

China, 513 projects (2025), broad PV-plus-agriculture definition¹⁰

Sources: ⁸ Goetzberger & Zastrow, Int. J. Solar Energy 1(1), 1982; ⁹ Fraunhofer ISE Agrivoltaics Guideline (2nd ed., 2022); ¹⁰ WRI China (Sept 2025).

02 • INTRODUCTION

The global picture: market and deployment

Agriphotovoltaics is a small but fast-growing part of the solar market. The last global estimate put capacity above 14 GW in 2021, up from a handful of pilots in 2012. Deployment has since shifted from pilots to commercial scale in Europe, East Asia and the United States.

USD 6.2 bn

2025 market estimate, broad boundary¹¹

~10 GW

United States, ~600 sites (2024), mostly grazing and pollinator habitat¹²

~2,970 GW

global cumulative PV, end-2025; agriphotovoltaics a small slice¹³

BOUNDARY

Figures are not additive. Sources differ by year and scope: some count only land that stays in crop or livestock use, others also include greenhouses and fishery-PV. Each figure above states its year and scope.

Why frameworks matter

Dedicated rules protect prime farmland, give investors bankable certainty, and make sure dual-use benefits are delivered. Definition and land-use law come first; balance safeguards with bankability.



1

Protect food output

Keep prime farmland productive and safeguard yields.

2

Unlock investment

Give developers and banks the certainty to deploy.

3

Capture co-benefits

Shade, water savings and a second income on one hectare.

Sources: ¹¹ Research and Markets (2025); ¹² NREL InSPIRE (Nov 2024); ¹³ IEA PVPS Snapshot 2026. Definitions differ by source.

02 • INTRODUCTION

What is driving adoption: six forces behind the scale-up

1 Land-use efficiency

Generating power and growing food on the same hectare helps reduce competition between energy and agriculture, with field trials reporting land-use efficiency gains well above 1. Fraunhofer ISE's APV-RESOLA site achieved a land-equivalent ratio of 186% in 2018.

2 Higher combined yields

For selected shade-tolerant or heat-stressed crops, agriphotovoltaics can improve yields by reducing heat and water stress. Results remain crop- and site-specific, so system design must match local crops and climate rather than assume universal yield gains.

3 Climate resilience & water

Partial shade from the panels can reduce irrigation needs in hot, dry climates and shelters crops from heat, hail, frost and drought. With more frequent extreme weather, this protection is itself a reason to adopt.

4 Farmer income & rural jobs

Agriphotovoltaics adds a stable second income from power sales or land lease alongside the harvest, cushioning commodity-price swings, supporting rural employment and helping keep marginal land productive rather than abandoned.

5 Falling costs, capital & tech

Cheaper modules, supportive policy and dual revenue streams are drawing capital into agriphotovoltaics. As bifacial, vertical and tracking systems mature, developers can better tailor shade, generation and crop conditions to local climates.

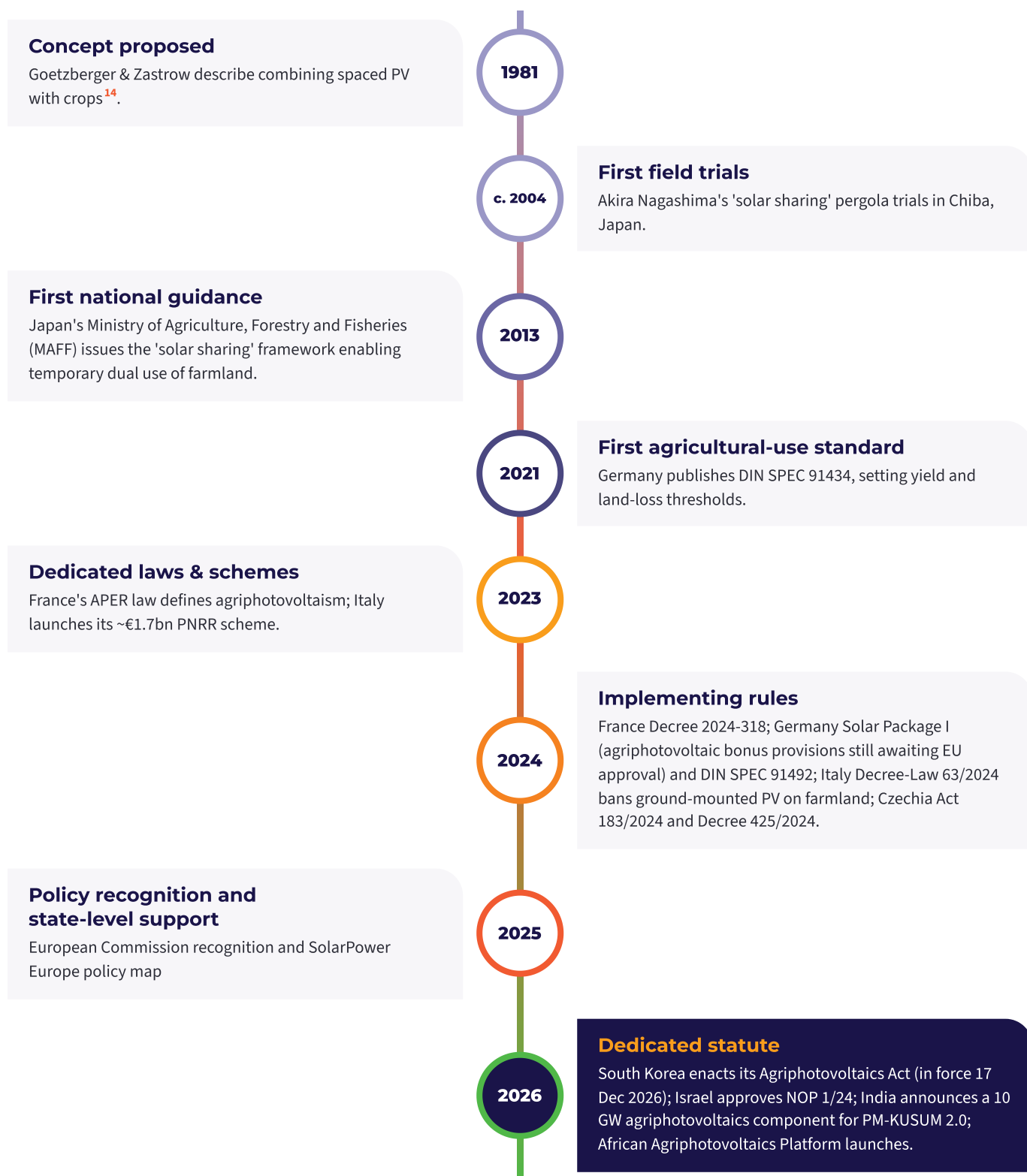
6 Energy security & net zero

Co-location lets countries add solar toward national renewable and net-zero targets without converting new land or competing with food production, easing the politics of siting and strengthening energy independence.

02 • INTRODUCTION

How agriphotovoltaics policy evolved

Policy has followed deployment: early national guidance (Japan), then an agricultural-use standard (Germany), then dedicated laws and incentive schemes and, lately, EU recognition and a dedicated statute in Asia.



Sources: ¹⁴ Goetzberger & Zastrow (1982), Fraunhofer ISE; Fraunhofer ISE (APV-RESOLA results; Agrivoltaics Guideline 2022); IEA PVPS (2025); NREL InSPIRE; MAFF Japan (2013); DIN SPEC 91434 (2021) and 91492 (2024); Loi APER 2023-175 and Décret 2024-318; DM MASE 436/2023; MAFRA Korea; MNRE India; OECD; Joint SDG Fund.

02 • INTRODUCTION

Scope and methodology

01	Country selection	32 country profiles from a desk review of primary legal texts and official documents, chosen to show every framework route (law, standard, scheme, permit, zoning plan) plus the most advanced pilots, tenders and roadmaps in each ISA region. Sub-national rules (Catalonia) are included where they are the operative framework. Not exhaustive and not a ranking. Not profiled in this edition: the United States (state rules only; covered in the overview and timeline), Kenya, Bangladesh, Sri Lanka, Indonesia and the Philippines; these are candidates for the next edition.
02	Review cut-off	Status as of 13 October 2026; developments after that date are not reflected.
03	Source hierarchy	(1) Primary legal texts, gazettes and official decrees; (2) documents of ministries, regulators and planning authorities; (3) reports of research institutes and multilateral bodies (Fraunhofer ISE, NREL, WRI, ADB, GIZ, IRENA, IEA PVPS); (4) trade press, used only for dates and status and flagged where a primary text was not yet published. Each profile's Sources line names its legal basis first.
04	Framework classification	Each country is tagged with its main entry routes. Categories overlap and are not mutually exclusive; the preferred reading is multidimensional: definition, agricultural safeguards, land use and permitting, CAP-type support, energy support, ownership, monitoring, maturity and deployment.
05	Maturity and success	Policy maturity refers to the framework and is distinct from market or project maturity (deployment). Best practices and success factors are transferable design considerations (hypotheses), not proven universal rules.
06	Limitations	Desk review without field verification; several 2025–26 instruments were available only through press reports at the cut-off; single pilots are reported as evidence, not as policy lessons; translations of non-English legal texts are the authors' own; capacity figures use differing system boundaries.

Key regulatory challenges

Targeted policy needs a clear definition of agriphotovoltaics, yet agriculture is so heterogeneous that the line between agriphotovoltaics and conventional ground-mounted PV is hard to draw. A central purpose of legal definitions is to separate genuine agriphotovoltaics from conventional ground-mounted PV on agricultural land. Policymakers must choose between broad and narrow definitions, high and low incentives, and strict and lenient agricultural criteria (e.g. France: yield generally above 90% of reference; Germany: at least 66%), while balancing agricultural safeguards against bankability.

DEFINITION

Broad  Narrow

INCENTIVES

Low  High

AGRICULTURAL CRITERIA

Lenient  Strict

02 • INTRODUCTION

2026: recent policy developments

In 2026, South Korea enacted a dedicated agriphotovoltaics act, Israel approved a national land-use plan for agriphotovoltaics and India announced a 10 GW component for PM-KUSUM 2.0.

DEDICATED AGRIPHOTOVOLTAIC COMPONENT

10 GW

announced under India's PM-KUSUM 2.0 (March 2026)

NEW

South Korea's Act: one of the world's first dedicated national agriphotovoltaics statutes

Six developments in 2025-26

1

South Korea: Agriphotovoltaics Act passed

Passed on 7 May 2026 and due to enter into force on 17 December 2026, it limits licensed project-operator eligibility to qualifying local farmers, resident-participation cooperatives and eligible agricultural corporations, extends temporary farmland use from 8 to 30 years and restricts projects in agricultural promotion zones to designated districts.

2

Israel: National zoning plan approved

The National Planning and Building Council approved NOP 1, Amendment 24 on 13 January 2026 (Government approval 15 February): coverage at most 30%, panel height 1.5–4.5 m by crop, at least 85% of land cultivated, yields at least 75% of the regional norm, and permits revocable after two years of sub-standard farming.

3

India: PM-KUSUM 2.0 is underway

Announced on 10 March 2026¹⁵ as the successor to PM-KUSUM, the 2.0 scheme is under preparation with a dedicated 10 GW agriphotovoltaics component; deadlines under the current scheme were extended to March 2027 to complete contracted projects.

4

Japan: Benchmarks tighten

About a quarter of sites (24% in FY2023) reported farming problems. FIT/FIP payments were suspended for 342 plants in 2024, and MAFF drafted national benchmarks: shading below 30%, panel height around 3 m, pillar spacing 4-5 m.

5

United States: State momentum

Massachusetts launched SMART 3.0 in autumn 2025 with an agriphotovoltaics adder, and New Jersey runs a dual-use solar pilot programme on farmland.

6

EU: Political recognition

The European Commission recognised solar PV in agriculture in its Vision for Agriculture and Food, the European Parliament followed with a report recognising agriphotovoltaics, and SolarPower Europe published an Agrisolar Policy Map comparing national rules.

Regional overview

Regional patterns are indicative only: approaches are often too country-specific to group by continent, especially in Asia and the Americas.

Europe

Most developed rules: Legal definitions, standards and incentive schemes are converging into bankable agriphotovoltaics frameworks.

Asia-Pacific

Diverse approaches: Countries are testing permits, farmer-centric laws, zoning rules and rural-energy schemes. China: project-led (c. 31 GW reported), with fragmented local rules and emerging standards; no single dedicated law.

Africa

Food-energy-water focus: Pilots are prioritising irrigation, water stress, rural livelihoods and climate-resilient agriculture.

Latin America & the Caribbean (LAC)

Pilot and project-based transition: Countries are using studies, pilots, concessions and island dual-use models to build policy evidence.

Sources: ¹⁵ PIB release 2237890 (10 Mar 2026); Korean Law Information Center, Act No. 21804; SFOC; Israel Planning Administration and pv magazine (24 Feb 2026); MAFF Japan; Massachusetts DOER SMART 3.0; New Jersey BPU Dual-Use Solar Energy Pilot Program; SolarPower Europe (2025).

03

SECTION

Global overview of agriphotovoltaics policy development

Evolution of agriphotovoltaics policy and regional
policy pathways

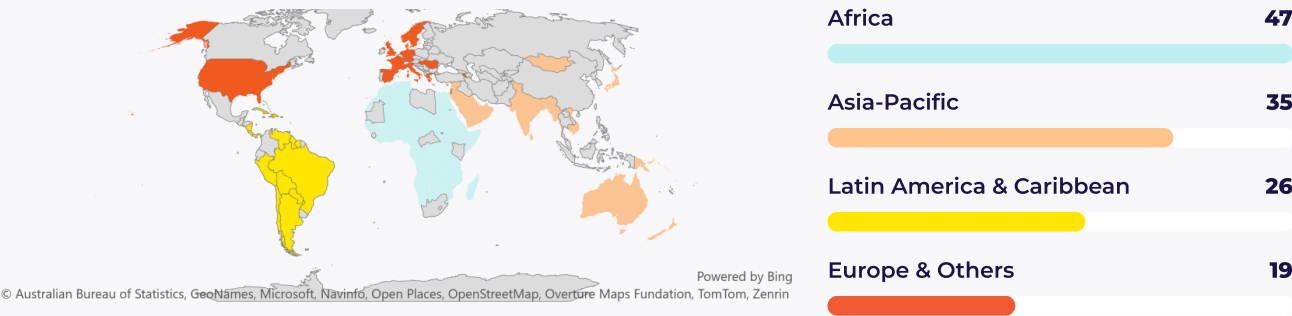
03 • GLOBAL OVERVIEW

Global overview of agriphotovoltaics policy development

Agriphotovoltaics policy is developing through different routes. Europe is moving from definitions and standards toward scale; Asia-Pacific combines permits, laws, zoning and schemes, with China’s market developing ahead of a dedicated national framework; Africa builds evidence through pilots; and LAC uses pilots, concessions and project models.

<div>Europe</div>	<div>CURRENT POLICY PATTERN</div> <div>Most advanced regulatory base, with legal definitions, standards, incentives and land-use safeguards.</div>	<div>WHAT IT MEANS FOR ISA MEMBER COUNTRIES</div> <div>Use Europe to learn how to define eligibility, protect agriculture and link incentives to compliance.</div>
<div>Asia-Pacific</div>	<div>CURRENT POLICY PATTERN</div> <div>Diverse models: China's project-led scale (~31 GW, no dedicated national law), Japan's permits, South Korea's act, India's scheme route, Israel's zoning plan.</div>	<div>WHAT IT MEANS FOR ISA MEMBER COUNTRIES</div> <div>Useful for countries choosing between law-led, scheme-led, zoning-led or permit-led approaches.</div>
<div>Africa</div>	<div>CURRENT POLICY PATTERN</div> <div>Mostly pilot, roadmap and project-led, focused on water stress, irrigation, rural services and resilience; covers off-grid community systems (The Gambia) as well as grid-connected projects (Togo).</div>	<div>WHAT IT MEANS FOR ISA MEMBER COUNTRIES</div> <div>Start with monitored pilots and convert evidence into standards and bankable policy.</div>
<div>LAC</div>	<div>CURRENT POLICY PATTERN</div> <div>Emerging through studies, pilots, concessions, island models and inclusive rural programmes.</div>	<div>WHAT IT MEANS FOR ISA MEMBER COUNTRIES</div> <div>Use project evidence to design land-use rules, finance structures and farmer-benefit models.</div>

Geographical spread of ISA Member and Signatory countries



Sources: country profiles, NREL InSPIRE (Nov 2024); WRI China (Sept 2025).

04

SECTION

Country policy profiles

32 country profiles using a standard policy-learning template
across ISA regions along with regional case-studies

04 • COUNTRY POLICY PROFILES

Country policy profiles

Countries are choosing different policy pathways depending on existing PV and agricultural support schemes (e.g. CAP), energy- and agricultural-policy objectives, land-use rules (e.g. limits on conventional ground-mounted PV), farmer income needs and institutional capacity. The following profiles are designed as policy-learning cards. They compare how leading countries define agriphotovoltaics, protect agricultural activity, regulate land use, structure incentives and monitor compliance, so ISA Member Countries can adapt relevant elements to their own land, crop, climate and institutional contexts.

How to read the country profiles:

1 Framework The main entry route (categories overlap).	2 Policy / instrument in place The actual law, scheme, standard, pilot, roadmap, tender or guidance document.	3 Distinctive policy lever The unique policy feature worth learning from.	4 Lesson The transferable takeaway for other countries.	5 Policy context The PV support, farm-support and land-use rules that were already in place and that the agriphotovoltaics policy had to fit into.
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Framework guide*

 Law-led Formal law or regulation	 Standard-led Eligibility rules set in a standard	 Incentive-led Grants, tariffs or auctions	 Scheme-led Linked to existing government programme
 Zoning-led Spatial or land-use rules	 Permit-led Temporary land-use approvals	 Pilot-led Evidence-building before regulation	 Roadmap-led Structured pathway before deployment
 Guidance-led Practical handbooks or voluntary guidance	 Tender-led Public procurement route	 Project-led Flagship demonstrator or commercial project	 Emerging Policy still under development

*Reader note: Each label names the lead instrument a country used first or relies on most; the routes are not mutually exclusive. Scheme-led and tender-led routes are also incentive-led, and every route eventually needs a legal basis. Where a country combines routes, the profile names the lead instrument and lists the others. Read the profiles as a menu of options, not a maturity ranking.

Sources: as cited on each profile.



04 · COUNTRY POLICY PROFILES

Europe

8 country profiles

PROFILES AND LEAD FRAMEWORK

01	Germany	☒ Standard-led
02	France	☒ Law-led
03	Italy	☒ Incentive-led
04	Spain	☐ Emerging
05	Netherlands	☒ Zoning-led
06	Austria	☒ Law-led
07	Greece	☒ Incentive-led
08	Czechia	☒ Law-led

EUROPE

Germany

Germany uses an agricultural-use standard and renewable-energy support rules to distinguish agriphotovoltaics from conventional ground-mounted PV on farmland.

COUNTRY SNAPSHOT

FRAMEWORK

Standard-led framework

POLICY / INSTRUMENT

DIN SPEC 91434 defines agricultural-use requirements; EEG 2023 tender bonus, Section 35 BauGB outer-area privilege, CAP rule (GAPDZV) and tax decrees all key off it

DISTINCTIVE POLICY LEVER

Uses an agricultural-use standard (66% yield, 10–15% land loss) to separate agriphotovoltaics from conventional ground-mounted PV on farmland.

LESSON

Start with an agricultural-use standard before scaling incentives so that only genuine agriphotovoltaics receives policy support.

KEY PROVISIONS

Policy purpose: Enable solar deployment on agricultural land while keeping farming as the main land use. Germany's approach addresses land-use conflict by setting measurable agricultural and design criteria.

Policy context: PV is supported through the EEG (market premium via tenders above 1 MW, feed-in for small systems); farmland is protected through planning law and CAP direct payments. Agriphotovoltaic rules were attached to all three (a tender sub-segment and bonus, an outer-area privilege, a CAP eligibility rule) plus tax neutrality, all keyed to DIN SPEC 91434.

Framework status: Germany's approach is led by DIN SPEC 91434:2021-05, which defines the agricultural-use requirements an installation must meet to count as agriphotovoltaic (minimum yield, maximum land loss, an agricultural-use concept, operation and maintenance); it does not specify PV design. DIN SPEC 91492:2024-06 extends the approach to livestock (stocking rate at least 85% of reference, land loss at most 15%) but is not yet referenced in any law or ordinance.

Policy design choice: Germany uses DIN SPEC 91434 as an agricultural-use filter to distinguish agriphotovoltaics from conventional ground-mounted PV. Reported criteria include:

- At least 66% of the reference agricultural yield
- Loss of usable area at most 10% for category I (elevated, clear height above 2.1 m) and 15% for category II (ground-near, cultivation between rows)
- An agricultural-use concept covering light, water and crop needs. How compliance with the 66% criterion is to be controlled in operation remains unresolved.

Implementation provisions: Planning law: Section 35(1) No. 9 BauGB privileges farm-linked agriphotovoltaic installations in the outer area where they occupy no more than 2.5 ha and are limited to one installation per farmstead or operating site. Tax: Land under DIN SPEC 91434 Category I or II installations remains agricultural

property for property, inheritance and gift, and real-estate transfer tax, while land under conventional ground-mounted PV is generally classified as Grundvermögen. CAP: From the 2025 application year, qualifying land remains eligible and only the area actually made agriculturally unusable is deducted, subject to the applicable maximum.

Incentives / approvals: In first-segment EEG tenders, elevated agriphotovoltaic systems with at least 2.10 m clearance receive a bonus declining from 1.2 ct/kWh in 2023 to 0.5 ct/kWh in 2026–28 under Section 38b(1) EEG; vertical and ground-near systems receive none. Solar Package I's dedicated sub-segment (Section 37d) and 9.5 ct/kWh ceiling (Section 37b(2)) remain suspended under Section 101 pending EU approval. The EEG 2027 draft, adopted by the federal cabinet in summer 2026, keeps a 0.5 ct/kWh bonus for agriphotovoltaic systems.

Compliance: Compliance is checked at eligibility, not in operation. To claim the tender bonus, the CAP rule or the tax treatment, the operator shows the installation is a category I or II installation under DIN SPEC 91434 at the time of bidding or claiming. Ongoing verification of the 66% yield criterion is not systematically enforced, and how it should be controlled remains unresolved.

POLICY LESSON FOR ISA MEMBERS

Start with an agricultural-use standard before scaling incentives: it gives governments one definition of eligible agriphotovoltaics and developers clear design expectations. Trade-off: a standard binds nobody on its own; its value is that the EEG, BauGB, GAPDZV and tax decrees all point to it, giving one consistent definition. The price is weak operational control and a low yield floor.

Summary: Relatively limited financial incentives (modest technology bonus) and a comparatively low minimum yield requirement, but a highly comprehensive framework covering tax, CAP eligibility, permitting and agricultural/technical requirements.

Sources: EEG 2023 §37(1) No. 3, §38b(1) (version in force to 15 May 2024, still applied under §101); Solar Package I (BGBl. 2024 I No. 151); §35(1) No. 9 BauGB (BGBl. 2023 I No. 176); GAPDZV §12(5), as amended (BGBl. 2022 I p. 139); coordinated Länder decrees on the Valuation Act, 15 July 2022 (BStBl 2022 I p. 1226); DIN SPEC 91434:2021-05; DIN SPEC 91492:2024-06; Bundesnetzagentur tender notices (2026); TFZ Bavaria agrivoltaics guide (2026); Fraunhofer ISE.

EUROPE

France

France gives agriphotovoltaics a legal identity and requires projects to support agricultural production, not simply occupy farmland.

COUNTRY SNAPSHOT

FRAMEWORK

 Law-led framework

POLICY / INSTRUMENT

Loi APER 2023-175 (art. 54) defines agriphotovoltaics; Decree 2024-318 sets the 90% yield, 10% land-loss and 40% coverage tests; Order of 5 July 2024 sets guarantees, controls and the land open to other photovoltaic projects.

DISTINCTIVE POLICY LEVER

Makes agricultural benefit a legal condition: projects must support agricultural production, not merely coexist with it.

LESSON

In food-security-sensitive countries, agriphotovoltaics should be approved only when agricultural value is legally demonstrated and monitored.

KEY PROVISIONS

Policy purpose: Accelerate renewable energy while protecting agricultural land, farmer activity and food-production functions. France's framework directly responds to the risk of "alibi projects", where farming becomes secondary to electricity generation. Conventional ground-mounted PV has largely been closed off on productive farmland, a major trigger for the law.

Policy context: Non-agriphotovoltaic ground-mounted PV is allowed on agricultural, natural or forest land only within categories listed in a departmental framework document proposed by the chambre d'agriculture (uncultivated land, land unfarmed for ten years, degraded sites). With productive farmland effectively closed to conventional PV, agriphotovoltaics became the only legal route onto it.

Framework status: Loi APER¹⁶ wrote the definition into the Energy Code (L.314-36). Decree 2024-318 of 8 April 2024 set the quantitative tests. The Order of 5 July 2024 sets the financial guarantees, the control and monitoring methodology (including the 90% livestock indicator), the reference-yield method, and the land categories on which other photovoltaic projects may still be built. The separate order listing proven technologies (R.314-115) was still pending at our check.

Policy design choice: France makes agricultural service a legal requirement: a project must contribute to agricultural production and provide at least one of four services (agronomic improvement, climate adaptation, protection against hazards, animal welfare). Decree 2024-318 (Energy Code R.314-108 to R.314-120) sets the tests: average yield on

the agriphotovoltaic parcel at least 90% of a control zone (at least 5% of the installation area, up to 1 ha) or a regional reference; area rendered non-cultivable at most 10% of the installation footprint; for installations above 10 MWp a coverage ratio of at most 40% unless the technology is recognised as proven; agricultural production must remain the main activity and secure a durable income for an active farmer.

Implementation provisions: The taux de couverture is the maximum horizontal ground projection of the modules in normal operating conditions divided by the area of the agricultural parcel: module tilt changes it, sun-angle shadow length does not. It is not a module-area ground-coverage ratio. France also requires control reports before commissioning and during operation, and financial guarantees for dismantling.

Incentives / approvals: France's framework ties project qualification to agricultural performance. This reduces the risk that incentives support conventional solar projects merely located on farmland.

Compliance: France requires control reports before commissioning and during operation to verify agricultural compatibility and reversibility.

POLICY LESSON FOR ISA MEMBERS

France shows how to make agricultural benefit enforceable, not voluntary. This is valuable where farmland protection and food security are politically sensitive.

Sources: ¹⁶ Loi n° 2023-175 du 10 mars 2023 (APER), art. 54, Code de l'énergie L.314-36; Décret n° 2024-318 du 8 avril 2024 (R.314-108 à R.314-120); Arrêté du 5 juillet 2024 (JORF 7 juillet 2024); CRE tender results (PPE2 PV Sol, PV Innovant); ADEME.

EUROPE

Italy

Italy uses public funding and technical criteria to shift agriphotovoltaics from pilots to bankable “advanced agriphotovoltaic” projects.

COUNTRY SNAPSHOT

FRAMEWORK

 **Incentive-led framework, on a legal ban**

POLICY / INSTRUMENT

MiTE Guidelines 2022, Ministerial Decree 436/2023 and the PNRR/RRF advanced agriphotovoltaics scheme support qualifying agriphotovoltaic projects through grants and tariff support

DISTINCTIVE POLICY LEVER

Uses grants and tariff support only for higher-quality “advanced agriphotovoltaic” systems that preserve agricultural activity.

LESSON

Incentives should reward high-quality agriphotovoltaic design, not simply subsidise any solar project located on farmland.

KEY PROVISIONS

Policy purpose: Scale renewable energy on agricultural land while protecting rural productivity and farmer participation. The decisive move came in May 2024: Decree-Law 63/2024, art. 5 (converted by Law 101/2024) banned new ground-mounted PV in zones classified agricultural, with exceptions for agriphotovoltaic systems with elevated modules, PNRR-funded projects and brownfield categories. The Constitutional Court upheld the ban¹⁷. Decree-Law 175/2025 (Law 4/2026) moved the rule into art. 11-bis of Legislative Decree 190/2024 and now requires a professional certification that at least 80% of gross saleable agricultural production is preserved.

Policy context: Italy's PV market runs on GSE auctions (FER decrees) and the PNRR recovery funds; agricultural land is protected by regional planning and, since 2024, a national ban on ground-mounted PV. Advanced agriphotovoltaics is the carve-out that lets PNRR money reach farmland.

Framework status: Italy's framework is tiered. (1) Conventional ground-mounted PV is banned on agricultural land. (2) Agriphotovoltaic systems that avoid the banned configuration and keep the land farmed remain permissible. (3) 'Advanced agriphotovoltaic' systems¹⁸ that meet height, area, output and monitoring requirements qualify for the PNRR incentive under Ministerial Decree 436 of 22 December 2023.

Policy design choice: Italy links public funding to advanced system design. Advanced systems must meet: module-area ratio (LAOR) at most 40%; at least 70% of the system area kept in agricultural use; minimum module height 2.1 m for crops, 1.3 m for livestock; specific electricity output at least 60% of a reference ground-mounted plant per hectare; monitoring of water use, agricultural productivity and continuity (plus soil fertility and microclimate for PNRR eligibility). The 60% electricity floor is unusual: most frameworks set only agricultural requirements.

Implementation provisions: DM 436/2023 (in force 14 February 2024) targets at least 1.04 GW and 1,300 GWh a year: capital grants of up to 40% of eligible costs (EUR 1.1 bn PNRR) plus a 20-year tariff (about EUR 560 m), 300 MW via registers for farms up to 1 MW and 740 MW via auctions, commissioning by 30 June 2026. The European Commission approved the EUR 1.7 bn scheme on 13 November 2023¹⁹.

Compliance: Italy's control point is incentive eligibility: projects must meet advanced design and agricultural-continuity requirements to access support.

POLICY LESSON FOR ISA MEMBERS

Italy is useful for countries considering concessional finance or grant windows. Public funding should be tied to design quality, farmer participation and verified agricultural continuity.

Sources: ¹⁷ Constitutional Court judgment 127/2026 (16 July 2026); ¹⁸ MiTE Linee guida impianti agrivoltaici (June 2022); Decree-Law 77/2021 art. 65(1-quater, 1-quinquies); ¹⁹ European Commission decision IP/23/5451 (13 November 2023); Ministerial Decree MASE 436 of 22 December 2023; Decree-Law 63/2024 art. 5 (Law 101/2024); Decree-Law 175/2025 (Law 4/2026), art. 11-bis Legislative Decree 190/2024; GSE.

EUROPE

Spain

Spain is still developing a dedicated agriphotovoltaics framework, but regional rules and Common Agricultural Policy (CAP) eligibility reforms are creating an early pathway for dual-use farmland.

COUNTRY SNAPSHOT

FRAMEWORK

Emerging framework

POLICY / INSTRUMENT

No dedicated national agriphotovoltaic law yet; Catalonia's agriphotovoltaics guidance and recent CAP eligibility updates provide early rules for keeping agriculture as the main activity.

DISTINCTIVE POLICY LEVER

Uses agricultural-payment eligibility as an early bridge, allowing farmers to retain support where farming remains the primary activity.

LESSON

Start by protecting farmers' agricultural-payment eligibility before building a full agriphotovoltaic law.

KEY PROVISIONS

Policy purpose: Spain's policy challenge is to allow solar expansion without turning productive agricultural land into conventional solar parks. Central policy is still emerging, while some regions have moved faster.

Policy context: Spain's PV boom runs on merchant projects and renewable auctions (REER); farmland is governed by regional planning and CAP direct payments under RD 1048/2022. Agriphotovoltaics first appears in national law as a CAP-eligibility carve-out, not as an energy-law category.

Framework status: Spain has no dedicated national agriphotovoltaics regulation; general PV rules apply, and the CAP amendment of October 2025 is the first national rule to name agriphotovoltaics.

Policy design choice: Spain is using agricultural-support eligibility as an early policy bridge. Royal Decree 916/2025²⁰ of 14 October adds paragraph 12 to art. 9 of RD 1048/2022: energy installations on a parcel count as unproductive and are deducted from the eligible area, except that for agriphotovoltaic installations on arable land and permanent crops the whole parcel remains eligible. Permanent grassland is not covered, so grazing under PV

stays subject to the deduction. The conditions ensuring that agriculture remains the main activity are left to later implementing rules.

Implementation provisions: Catalonia's technical instruction²¹ requires agricultural activity to be maintained for the project's life, yield at least 60% of the reference, land lost to structures at most 15% (elevated) or 20% (ground-level), no concrete foundations except for transformer stations, and a five-year monitoring programme.

Compliance: The national rule contains no definition of 'agriphotovoltaic installation' and no criteria, so which systems qualify is unclear in most regions: an example of what happens when CAP eligibility is adjusted before agriphotovoltaics is defined. Until implementing rules arrive, regional guidance such as Catalonia's is the only operational safeguard.

POLICY LESSON FOR ISA MEMBERS

Spain shows that countries do not need to start with a complete agriphotovoltaic law. A practical first step is to ensure farmers do not lose agricultural benefits when credible dual use continues.

Sources: ²⁰ Real Decreto 916/2025, de 14 de octubre (BOE 15 October 2025), amending RD 1048/2022, art. 9; ²¹ Catalonia DACC instrucció tècnica on agrovoltàics (April 2024); CMS Spain agrivoltaics guide; pv magazine Spain.

EUROPE

Netherlands

The Netherlands treats agriphotovoltaics as a limited exception within a strict land-use hierarchy, making the model useful for land-scarce countries.

COUNTRY SNAPSHOT

FRAMEWORK

Zoning-led framework

POLICY / INSTRUMENT

No dedicated agriphotovoltaic law yet; the Zonneladder solar preference order restricts solar on agricultural land, with agriphotovoltaics treated as a dual-use exception.

DISTINCTIVE POLICY LEVER

Places agriphotovoltaics inside a land-use hierarchy, allowing farmland solar only where dual use is credible and spatially justified.

LESSON

Land-scarce countries should define where solar should not go, then allow agriphotovoltaics only as a genuine dual-use exception.

KEY PROVISIONS

Policy purpose: Manage land scarcity and reduce conflict between agriculture, nature, housing and renewable-energy deployment. Dutch solar policy prioritises rooftops and developed spaces before agricultural land.

Policy context: solar is supported through the SDE++ subsidy; the national solar preference order (Zonneladder, in the NOVI) steers PV to roofs and brownfield first and treats agricultural and nature land as last resort, so agriphotovoltaics exists as a function-combining exception rather than a promoted route.

Framework status: The Netherlands does not yet have a dedicated national agriphotovoltaic law. However, the national Zonneladder or solar preference order discourages solar on agricultural and nature land, while allowing function-combining exceptions such as agriphotovoltaics.

Policy design choice: The Netherlands uses spatial prioritisation rather than direct agriphotovoltaics incentives. This prevents agricultural land from becoming

the default location for solar development.

Implementation provisions: agriphotovoltaic projects generally require environmental and planning approvals. Existing zoning plans may not recognise dual-use solar, making local permitting a major implementation issue.

Compliance: The main compliance challenge is definitional. Without a binding agriphotovoltaics definition, authorities need ex-ante review to confirm that agriculture is not merely a token activity.

POLICY LESSON FOR ISA MEMBERS

The Dutch model is useful for densely populated or land-constrained countries. It shows that agriphotovoltaics policy should be linked to land-use planning, landscape acceptance and rural spatial strategy.



Sources: Environment and Planning Act (Omgevingswet, 2024); NOVI solar preference order (Zonneladder); RVO solar policy; Wageningen University agrivoltaics landscape study; CMS Netherlands agrivoltaics guide.

EUROPE

Austria

Austria combines a federal agriphotovoltaics definition and incentive criteria with Länder-level spatial planning and municipal approvals.

COUNTRY SNAPSHOT

FRAMEWORK

Law-led framework with state zoning

POLICY / INSTRUMENT

EABG 2026 defines agri-solar installations (agricultural main use, even module distribution, at least 75% agricultural area); EAG grant rules waive the 25% farmland deduction for them; Länder spatial-planning laws and municipal zoning decide approval.

DISTINCTIVE POLICY LEVER

Shows that national recognition must be matched with state and municipal zoning rules to make projects implementable.

LESSON

A national agriphotovoltaics definition is not enough; zoning categories and local approval pathways must also be updated.

KEY PROVISIONS

Policy purpose: Reduce conflict between renewable-energy expansion and agricultural land consumption while supporting Austria's renewable-energy transition.

Policy context: Austria supports PV through EAG investment grants and market premiums; land use is a Länder competence. The EAG already treated 'agriphotovoltaics areas' more favourably in its grant rules; the EABG 2026 adds the federal definition those rules lacked.

Framework status: The Renewable Expansion Acceleration Act (EABG)²² adds a federal definition in Section 5(1): an agri-solar installation keeps agricultural production as the main use, distributes modules evenly across the project area unless existing biotope structures require otherwise, and keeps at least 75% of the project area in agricultural production. The EAG (Section 5(1) Z 2) had only defined 'agriphotovoltaics areas' as land used for both PV and agriculture.

Policy design choice: Austria separates national recognition from local implementation. The federal framework recognises dual use, but practical feasibility is determined by state spatial-planning acts, municipal zoning plans, electricity laws and building codes.

Implementation provisions: Project approval depends on the specific state and municipality. Nature conservation, animal protection and landscape rules may also apply

depending on site and agricultural use. Financial support (EAG): qualifying agriphotovoltaics systems are exempt from the 25% reduction in investment support that normally applies to PV on agricultural or grassland areas.

Incentives: under Section 56(8) EAG the investment grant for PV on agricultural or grassland areas is cut by 25%. Section 56(10) EAG and Section 6 of the investment-grant ordinance²³ waive the cut entirely for agriphotovoltaic systems meeting the same three criteria (agricultural main use, even module distribution, at least 75% agricultural use), and a 30% innovation bonus is available for vertical or elevated designs. The market-premium ordinance applies parallel criteria (module lower edge at least 80 cm, row spacing at least 2 m).

Compliance: Compliance is controlled through spatial planning, electricity-law approvals, building codes and local permitting, rather than a single dedicated agriphotovoltaics compliance system.

POLICY LESSON FOR ISA MEMBERS

Austria shows that policy must be institutionally aligned. If national ministries define agriphotovoltaics but local authorities lack zoning tools, projects may remain stuck at the permitting stage.

Sources: ²² Renewable Expansion Acceleration Act (EABG) §5 Z 1, BGBl. I No. 47/2026, published 1 July 2026; initial provisions in force 2 July 2026, most provisions from 1 January 2027; ²³ EAG-Investitionszuschüsseverordnung-Strom (BGBl. II No. 64/2023, amended 76/2025, 12/2026) §6; EAG (BGBl. I No. 150/2021) §5(1) Z 2, §56(8), (10), (11); EAG-Marktprämienverordnung 2022 §6; Länder spatial-planning acts; klimaaktiv; BMWET; AgriVoltaics Conference legal analysis on Austria.

EUROPE

Greece

Greece has introduced a farmer-focused agriphotovoltaic programme with capacity caps, and fixed tariff.

COUNTRY SNAPSHOT

FRAMEWORK

 Incentive-led framework

POLICY / INSTRUMENT

Law 5261/2025 establishes a regionally capped agriphotovoltaics programme outside competitive auctions, with fixed-price support subject to European Commission approval and the reference price to be set separately.

DISTINCTIVE POLICY LEVER

Allows registered professional farmers and qualifying third-party developers, while limiting each eligible person to two projects and requiring agreements with the agricultural land or greenhouse holder where applicable

LESSON

Allow farmer-led and third-party investment, but protect farming through project caps, landholder agreements, annual agricultural-performance monitoring and a performance-backed guarantee.

KEY PROVISIONS

Policy purpose: Support farmers directly while adding distributed solar capacity across Greece's regions.

Policy context: Greek solar PV initially expanded through feed-in tariffs and later through competitive support under Law 4414/2016. Law 5261/2025 creates a separate agriphotovoltaics route outside competitive auctions, open to registered professional farmers and qualifying third parties with agreements with agricultural land or greenhouse holders. Agricultural-land classification continues to govern project siting.

Framework status: Articles 67 and 68 of Law 5261/2025²⁴ establish the siting, licensing, support and compliance framework for agriphotovoltaic stations. Eligible projects may conclude fixed-price operating-support contracts under Article 10 of Law 4414/2016 following European Commission approval, with the applicable reference price to be determined separately

Policy design choice: Greece combines farmer access with controlled third-party participation. Registered professional farmers may develop projects on land they cultivate, while third-party natural or legal persons may participate where they have an agreement with the holder or manager of the cultivated land or greenhouse. Each eligible person may install up to two agriphotovoltaic stations.

Implementation provisions: Stations must use elevated structures of at least 2.10 metres over cultivated land or greenhouse installations. Panels and associated equipment may occupy no more than 10% of the initially cultivated area. Projects are generally prohibited on high-productivity agricultural land, except when installed on greenhouse roofs

Compliance: For ten years after commissioning, the project holder must submit an annual technical report showing that agriculture remains the principal activity and that agricultural yield remains at least 66% of the pre-installation level. A EUR 100/kW guarantee supports this obligation. Continued non-compliance may result in escalating penalties, full forfeiture of the guarantee, dismantling and restoration of the land.

POLICY LESSON FOR ISA MEMBERS

Greece shows how agriphotovoltaics can accommodate both farmer-led and third-party investment while protecting agricultural use. Project limits, landholder agreements, annual yield verification and performance-backed guarantees can prevent concentration and keep farming at the centre of project operation.

Sources: ²⁴ Law 5261/2025 (Government Gazette A' 231, 12 December 2025); Law 4414/2016 art. 10; HEDNO application platform (March 2026); DAPEEP; Balkan Green Energy News; energypress.

EUROPE

Czechia

Czechia has moved quickly from pilots to a defined agriphotovoltaics framework, using crop eligibility, system categories and subsidy support to keep land agricultural.

COUNTRY SNAPSHOT

FRAMEWORK

 Law-led framework

POLICY / INSTRUMENT

2025 agriphotovoltaics legislation and RES+ Call 6/2025 define eligible crops, system types, agricultural land status and subsidy support.

DISTINCTIVE POLICY LEVER

Keeps land legally agricultural through LPIS Agricultural Land Fund treatment while defining eligible crops and system types upfront.

LESSON

Define eligible crops, system types and land-registration treatment before releasing subsidies.

KEY PROVISIONS

Policy purpose: Combine clean-energy generation with continued crop production while reducing pressure to build conventional solar parks on open or ecologically sensitive land.

Policy context: Czech PV support runs through the Modernisation Fund (RES+ calls) rather than feed-in tariffs; the agricultural land fund law normally requires land under PV to be withdrawn from agricultural use. The 2024 amendment lets agriphotovoltaic plants stay in the fund and in LPIS, which is what keeps farm subsidies intact.

Framework status: Act 183/2024 (in force 1 July 2024) inserted §8a on agriphotovoltaic plants into Act 334/1992 on protection of the agricultural land fund; the joint Environment and Agriculture Decree 425/2024 (in force 1 January 2025), amended by Decree 463/2025 (in force 1 December 2025), sets eligible land and technical rules. RES+ Call 6/2025 under the Modernisation Fund is a dedicated agriphotovoltaics window: CZK 300 m (plus up to CZK 200 m reserve), grants of up to 30% of eligible costs for plants of at least 10 kWp to 1 MWp on LPIS-registered land, applications 15 January 2026 to 30 June 2027, open to registered agricultural entrepreneurs.

Policy design choice: Czechia regulates by technology and land use, not by yield. Eligible land is vineyards, hop gardens, orchards, nurseries, container areas and truffle

plots (fallow of up to two years allowed when establishing or renewing), extended in December 2025 to arable land where at least 90% of the LPIS block received support for labour-intensive vegetables. No minimum agricultural yield is set; protection comes from choosing crops expected to cope with partial shade.

Implementation provisions: Horizontal systems: modules at least 2.1 m above the soil and at least 95% of the area usable for farming. Vertical systems: the ratio of row spacing to maximum module height must be at least 3 (a 2 m-high system needs 6 m rows) and at least 80% of the area must remain usable. Decree 463/2025 measures the 2.1 m with trackers horizontal and brings storage within the rules.

Compliance: Agricultural land remains registered in the Land Parcel Identification System and does not need to be removed from the Agricultural Land Fund, helping preserve subsidy eligibility and agricultural status.

POLICY LESSON FOR ISA MEMBERS

Czechia shows how to reduce ambiguity before projects begin: eligible crops, design ratios and land-registration treatment are fixed upfront. Trade-off: no operational yield test means low administrative burden and high bankability, but eligible area is small, so scaling potential is limited.

Sources: Act No. 183/2024 Coll.; Act No. 334/1992 Coll. §8a; Decree No. 425/2024 Coll.; Decree No. 463/2025 Coll.; RES+ Call No. 6/2025 (SFŽP, Modernisation Fund); Ministry of Agriculture agrivoltaics page; Czech Solar Association.

EUROPE • CASE STUDIES

Europe case studies: case evidence and emerging policy considerations

What each case shows; single cases are evidence, not proven lessons

Policy trigger → Enabling instrument → Implementation model → Policy consideration

01 Germany	02 France	03 Italy
Turning pilots into agriphotovoltaics standards	Making agricultural benefit a legal requirement	Using public finance to scale advanced agriphotovoltaics
1 POLICY TRIGGER EEG tenders, planning law and CAP rules each needed one test for what counts as agriphotovoltaics	1 POLICY TRIGGER Productive farmland was largely closed to conventional ground-mounted PV, so a legal route onto farmland was needed that ruled out 'alibi projects'	1 POLICY TRIGGER The 2024 ban on ground-mounted PV on agricultural land left elevated agriphotovoltaics as the main route onto farmland
2 ENABLING INSTRUMENT DIN SPEC 91434 converted pilot learning into agricultural-use eligibility criteria for genuine agriphotovoltaics	2 ENABLING INSTRUMENT APER Law and the 2024 decree made agricultural benefit a legal requirement.	2 ENABLING INSTRUMENT A €1.7 billion PNRR/RRF-backed scheme supported advanced agriphotovoltaics through grants and tariff support
3 IMPLEMENTATION MODEL APV-RESOLA tested farming and PV co-location, creating evidence for standards and later support rules	3 IMPLEMENTATION MODEL Ombrea's crop-protection expertise was scaled through TotalEnergies' agriphotovoltaics portfolio	3 IMPLEMENTATION MODEL Support was targeted to advanced systems, with capacity windows for agricultural entrepreneurs
4 POLICY CONSIDERATION Standardise, then pay	4 POLICY CONSIDERATION Make the agricultural benefit a legal test with numbers	4 POLICY CONSIDERATION Pay only for designs that meet the test

Sources: as on the Germany, France and Italy profiles; Fraunhofer ISE APV-RESOLA; TotalEnergies–Ombrea.



04 • COUNTRY POLICY PROFILES

Asia-Pacific

8 country profiles

PROFILES AND LEAD FRAMEWORK

01	Japan	Permit-led
02	South Korea	Law-led
03	India	Scheme-led
04	China	Project-led
05	Israel	Zoning-led
06	Australia	Guidance-led
07	Vietnam	Pilot-led
08	Thailand	Roadmap-led

ASIA-PACIFIC

Japan

Japan uses temporary farmland-conversion permits and yield monitoring to keep “solar sharing” tied to real farming.

COUNTRY SNAPSHOT

FRAMEWORK

 Permit-led framework

POLICY / INSTRUMENT

Agricultural Land Act and MAFF solar-sharing guidance allow agriphotovoltaics through temporary farmland-conversion permits, with continued cultivation and yield checks.

DISTINCTIVE POLICY LEVER

Requires farming to continue under panels, with periodic review and yield monitoring linked to permit validity.

LESSON

Use time-bound permits with agricultural-performance checks so agriphotovoltaics does not become disguised land conversion.

KEY PROVISIONS

Policy purpose: Japan promotes solar sharing to expand renewable energy while protecting scarce farmland and maintaining agricultural production. MAFF states that agriphotovoltaic facilities require temporary farmland-conversion permission and continued farming under the panels.

Policy context: Japan's FIT Act (2012) made solar bankable; farmland protection under the Agricultural Land Act made it inaccessible. Solar sharing is the compromise: PV on farmland only as a temporary, removable use with the land staying agricultural.

Framework status: Japan is a permit-led model under the Agricultural Land Act. The permit route was created by the MAFF notification of 31 March 2013 on PV structures with continued farming: temporary farmland-conversion permits of up to three years (up to ten years in some cases since 2018), renewable, with removal required if yields fall 20% or more below the regional average. The notice was revised in May 2018 and folded into the Agricultural Land Act enforcement rules from 1 April 2024. Deployment was driven at least as much by the national feed-in tariff: in FY2013 PV of 10 kW or more received JPY 36/kWh (tax-exclusive) for 20 years, after JPY 40/kWh in FY2012, so land-use permission and a strong tariff arrived together.

Policy design choice: Japan allows solar structures on farmland only as a temporary and removable use, while the land remains agricultural. Earlier rules used periodic reviews, and reported guidance requires agricultural yield to remain at least 80% of the regional average, with relaxed treatment for degraded farmland.

Implementation provisions: Project owners must maintain cultivation below panels and comply with farmland, electricity safety and local consultation requirements. MAFF also highlights use cases such as crop cultivation, disaster-resilience power supply, smart agriculture and self-consumption.

Compliance: The core compliance tool is permit continuation. If agriculture is not properly maintained, temporary conversion approval can be reviewed or revoked. About a quarter of sites (24% in FY2023) reported farming problems; FIT/FIP payments were suspended for 342 plants in 2024, and MAFF drafted national benchmarks (2026): shading below 30%, panel height around 3 m and pillar spacing of 4–5 m for machinery.

POLICY LESSON FOR ISA MEMBERS

Japan is useful for countries with strong farmland-protection concerns. A temporary-permit framework can allow cautious agriphotovoltaics deployment while retaining the right to withdraw approval if farming becomes tokenistic.

Sources: Agricultural Land Act (Act No. 229 of 1952) and enforcement rules (temporary conversion for solar sharing, from 1 April 2024); MAFF notification of 31 March 2013 (replaced 15 May 2018); Act on Special Measures for Renewable Energy (FIT Act, 2012) and METI tariff decisions FY2012–13; MAFF solar-sharing guidance.

ASIA-PACIFIC

South Korea

South Korea has enacted a dedicated agriphotovoltaics law, in force from 17 December 2026, that keeps operator eligibility farmer-centric and zoning-controlled.

COUNTRY SNAPSHOT

FRAMEWORK

Law-led framework

POLICY / INSTRUMENT

Act on the Promotion and Support of Agriphotovoltaics (in force 17 December 2026) sets a dedicated framework with farmer-centric operator eligibility and zoning controls.

DISTINCTIVE POLICY LEVER

Limits licensed project-operator eligibility to qualifying local farmers, resident-participation cooperatives and eligible agricultural corporations.

LESSON

Protect farmer ownership and rural value retention when opening agricultural land for solar generation.

KEY PROVISIONS

Policy purpose: South Korea is using agriphotovoltaics to address land scarcity, rural income needs and renewable-energy expansion while preventing farmland speculation. The country has limited farmland, and more than 60% of its territory is mountainous.

Policy context: Renewable portfolio obligations created demand for PV, while the Farmland Act capped temporary non-farm use at eight years and protected agricultural promotion zones, making farm-based projects unbankable. Once in force, the 2026 Act addresses that by extending temporary use to 30 years and limiting licensed operator status to farmers, resident cooperatives and Agricultural corporations.

Framework status: The National Assembly passed the Act on the Promotion and Support of Agriphotovoltaics (Act No. 21804) on 7 May 2026; it was promulgated on 16 June 2026 and enters into force on 17 December 2026, together with Farmland Act amendments that extend temporary farmland use for agriphotovoltaics from 8 to 30 years. Implementing rules were still pending at the review cut-off.

Policy design choice: The law makes agriphotovoltaics a rural-participation model rather than a developer-led land programme. Licensed project-operator eligibility is limited to qualifying local farmers, resident-participation cooperatives and eligible agricultural corporations; this does not necessarily bar outside financing or contractual participation.

Implementation provisions: From 17 December 2026, the law extends land-use permits for agriphotovoltaic projects from 8 to 30 years, improving long-term bankability. However, agriphotovoltaics remains restricted in Agricultural Promotion Zones unless the land is separately designated as a Renewable Energy Zone.

Compliance: Reported provisions include obligations to continue farming and manage facilities, with corrective orders, penalty surcharges and potential cancellation of business rights for violations.

POLICY LESSON FOR ISA MEMBERS

South Korea is relevant for countries worried about land capture. Agriphotovoltaics frameworks should define who can participate, how benefits remain with farmers and how zoning protects priority farmland.

Sources: Act on the Promotion and Support of Agrivoltaics (Act No. 21804; passed 7 May 2026, promulgated 16 June 2026, in force 17 December 2026); Farmland Act amendments (2026); MAFRA; SFOC analysis; National Assembly reporting.

ASIA-PACIFIC

India

India is moving from farm-solar support toward a dedicated agriphotovoltaic component under PM-KUSUM 2.0.

COUNTRY SNAPSHOT

FRAMEWORK

 Scheme-led framework

POLICY / INSTRUMENT

PM-KUSUM is the existing rural solar scheme; PM-KUSUM 2.0 with a dedicated 10 GW agriphotovoltaic component has been announced and is under preparation

DISTINCTIVE POLICY LEVER

Uses an existing farmer-energy scheme as the platform to scale agriphotovoltaics nationally.

LESSON

Build agriphotovoltaics on existing rural-energy programmes rather than creating a completely separate policy channel. Position it as a farmer-income instrument, not only a solar subsidy.

KEY PROVISIONS

Policy purpose: India aims to improve farmer income, reduce irrigation energy costs and support decentralised renewable energy in rural areas. PM-KUSUM already supports solar pumps, feeder solarisation and decentralised renewable-energy plants.

Policy context: PM-KUSUM (2019) already subsidises solar pumps (Components B and C) and decentralised plants up to 2 MW on farmers' land (Component A); farmland is regulated by the states. Agriphotovoltaics enters as a component of this existing scheme rather than through a new law.

Framework status: India does not yet have a notified national agriphotovoltaics regulation. On 10 March 2026 the Government announced that PM-KUSUM 2.0 is being prepared with a dedicated 10 GW agriphotovoltaics component²⁵; the scheme is announced and under preparation, not yet operational.

Policy design choice: India's distinctive model is to use PM-KUSUM as the institutional base for agriphotovoltaics. This can link solar generation, farmer income, irrigation demand, DISCOM procurement and decentralised rural grids.

Implementation provisions: Existing PM-KUSUM allows farmers, cooperatives, panchayats, FPOs and water-user associations to set up decentralised renewable-energy plants under Component A, while Components B and C support solar pumps and grid-connected pump solarisation.

Compliance: Current PM-KUSUM compliance is scheme-based. For the proposed agriphotovoltaic component, India will need crop-compatible design standards, agricultural-continuity checks, land-use criteria and farmer-benefit rules.

Gaps for the 10 GW component: Component A guidelines prefer barren or uncultivable land and allow cultivable land only with stilt-mounted panels; land-use conversion is left to state revenue law, so the component needs a rule that keeps agriphotovoltaic land agricultural. Tenant farmers, often on informal leases, risk losing access while lease income goes to owners. Field evidence already exists (ICAR-CAZRI Jodhpur; Junagadh Agricultural University), but there is no national technical definition or standard. The 10 GW component therefore needs a definition, crop-specific thresholds and a monitoring and verification system, built on template parts 2, 4, 7 and 8 (see Model framework: suggested template structure).

POLICY LESSON FOR ISA MEMBERS

India shows how agriphotovoltaics can be embedded into large rural-energy programmes. This is useful for countries that already have solar pump, feeder-solarisation or rural-energy subsidy schemes.

Scaling pathway: ICRIER pilots and analysis point to PM-KUSUM 2.0 as a farmer-income, decentralised-energy and rural-development instrument. The Farmer and DISCOM economics section that follows sets out the farmer and DISCOM economics, collective ownership models and financing needed to make it bankable.

Sources: ²⁵ PIB release 2237890 of 10 March 2026 on PM-KUSUM 2.0; PM-KUSUM scheme guidelines (MNRE, 2019, as amended); PM-KUSUM portal.

ASIA-PACIFIC

India (continued)

PM-KUSUM 2.0 can position agriphotovoltaics as a farmer-income, decentralised-energy and rural-development instrument, not only a solar subsidy channel.

Farmer and DISCOM economics

Lever	Evidence / proposal	Why it matters	Open questions
Remunerative feed-in tariff	ICRIER's PM-KUSUM-based pilots in Rajasthan estimate that a FiT of about INR 4.40 to 4.50/kWh, with some capital support, can raise farmer income 8 to 10 times.	DISCOMs would buy decentralised power well below the average cost of supplying farm power (about INR 8.5/kWh) ²⁶ , reducing farm-power subsidy.	Income multiple and tariff are pilot estimates; test against state tariff orders and DISCOM cost-of-supply data.
Collective ownership	FPO, cooperative and solar-cooperative models, on the lines of the milk cooperatives under Operation Flood. ICRIER's Odisha pilot tests a farmer institution-owned plant with a collective PPA with DISCOMs.	Pools the capital and scale that individual smallholders lack and keeps more of the value within rural communities.	Governance of collectives, PPA risk allocation and DISCOM payment security.
Capital support	PM Surya Ghar (rooftop solar) gives central financial assistance of 60% of benchmark cost up to 2 kW and 40% for 2 to 3 kW, with top-ups in some states. Comparable support under PM-KUSUM 2.0 could close the cost gap for elevated systems.	Elevated, crop-compatible structures cost more than ground-mounted PV; without capital support the farmer case may not close.	Fiscal cost against avoided farm-power subsidy; impact on DISCOM finances, with PM Surya Ghar as comparator.

Making agriphotovoltaics bankable and farmer-centric:

Financing stack: Combine differentiated FiTs by system type, capital subsidy or viability gap funding (VGF) for higher-cost elevated systems, Priority Sector Lending, and concessional and catalytic finance to de-risk early projects. The test is which combination makes a project bankable for the farmer.

Farmer benefit-sharing: Move from broad income protection to enforceable terms: minimum farmer revenue shares, ownership or co-ownership requirements, lease-income safeguards, dividend structures for FPOs and cooperatives, and transparent, standardised PPAs.

Agricultural safeguards: Set panel height, shading and land-coverage thresholds by crop, agro-climatic zone and machinery needs rather than one national threshold,

and use pilot evidence to update PM-KUSUM 2.0 technical standards.

Wider gains: Clean power generated close to rural load, lower farm-power subsidy, and a base for rural enterprise and agro-processing.

POLICY LESSON FOR ISA MEMBERS

Where farm power is subsidised, buying agriphotovoltaic power below the cost of supply can raise farm income and lower subsidy bills at the same time. The case rests on procurement terms as much as on capital support.

Sources: ²⁶ Cost-of-supply figure as cited by ICRIER (2026); state values differ by tariff order; ICRIER comments on this compendium and ICRIER agrivoltaics pilot work in Rajasthan and Odisha (2026); PM Surya Ghar: Muft Bijli Yojana, Union Cabinet approval (29 February 2024) and MNRE guidelines (2024). Pilot figures are ICRIER estimates.

ASIA-PACIFIC

China

China has scaled “PV+ agriculture” through large project models, but its key lesson is the need to improve design quality and land-use discipline.

COUNTRY SNAPSHOT

FRAMEWORK

Project-led, with fragmented local rules and emerging standards

POLICY / INSTRUMENT

No single dedicated agriphotovoltaic law; deployment is driven through PV+ agriculture fisheries grazing ecological restoration models, with growing work on technical standards and monitoring.

DISTINCTIVE POLICY LEVER

Uses large-scale integrated models such as PV + fisheries, PV + greenhouses, PV + grazing and PV + ecological restoration.

LESSON

Scaling agriphotovoltaics requires design standards and monitoring, otherwise high land coverage can weaken agricultural outcomes.

KEY PROVISIONS

Policy purpose: China uses PV-agriculture integration to support clean-energy deployment, rural development, ecological restoration and more efficient land use. Research identifies major “PV+” models including ecological restoration, agriculture/forestry/livestock/fisheries and facility agriculture.

Policy context: utility-scale PV grew under national feed-in tariffs until 2021 and now at grid parity; farmland is protected by the national arable-land 'red line' and 2023 Ministry of Natural Resources rules restricting PV on cultivated land, which push projects toward 'PV+' models on marginal land, fishponds and greenhouses.

Framework status: China is best understood as a project-led model, not a dedicated-law model. The World Resources Institute (WRI) identified 513 publicly documented projects totalling about 31 GW²⁷, on a broad definition covering crops, grazing, aquaculture and greenhouses.

Policy design choice: China's distinctive lever is project-model diversification. Different regions deploy PV + fisheries, PV + greenhouses, PV + grazing, PV + crop cultivation and PV + ecological restoration depending on resource conditions.

Implementation provisions: Some initiatives are moving toward formal technical and ecological standards. An Asian Development Bank (ADB) technical-assistance project in

Hunan (USD 0.8 m)²⁸ is researching 'PV Plus' policy on site selection and project approval, ecological-restoration monitoring and diversified land use.

Standards and local rules: In the absence of a national standard, industry group standards guide design, notably the Technical Guideline for Agricultural PV Systems (Q/0325-1.1-2016) of the National Strategic Alliance for Collaborative Innovation in Modern Agricultural PV Industry (AMAPV). Provincial and local measures add to this, including Ningxia's 2018 policy (Ningxia Development Reform Energy (Development) [2018] No. 118), Hunan Department of Natural Resources rules and a 2021 agriphotovoltaics subsidy in Pinghu City, Zhejiang. The national policy of balancing arable-land occupation with compensation (1986) underpins limits on PV on cultivated land.

Compliance: WRI notes that many projects have high land-coverage ratios, showing the need for improved design and land-use management to balance energy generation with agricultural productivity.

POLICY LESSON FOR ISA MEMBERS

China shows that scale alone is not enough. Countries should avoid copying large PV + agriculture projects without crop-specific design rules, land-coverage limits, ecological assessment and agricultural-output monitoring.

Sources: ²⁷ WRI China (Sept 2025), Agrivoltaics in China: Status, Potential and Pathways for Synergistic Energy–Agriculture Development; ²⁸ ADB TA 58303-001 report (Dec 2024); Sustainability (2025) review of China's photovoltaic agriculture; AMAPV group standard Q/0325-1.1-2016; Ningxia DRC [2018] No. 118; Department of Natural Resources of Hunan Province; Pinghu City agrivoltaics subsidy (2021).

ASIA-PACIFIC

Israel

Israel uses a zoning-led framework with explicit design thresholds, approval tracks and agricultural-performance requirements.

COUNTRY SNAPSHOT

FRAMEWORK

 Zoning-led framework

POLICY / INSTRUMENT

2026 national agriphotovoltaics outline zoning plan sets coverage limits, crop-specific height rules, protected-area exclusions, approval tracks and research-plot requirements.

DISTINCTIVE POLICY LEVER

Sets hard planning thresholds: panel coverage, height, protected-area exclusions, fast-track permits and research plots for larger projects.

LESSON

Use zoning rules to make agriphotovoltaics predictable, measurable and environmentally controlled from the start.

KEY PROVISIONS

Policy purpose: Israel's framework responds to the need to expand solar energy while preserving cultivated land, ecological corridors and sensitive landscapes.

Policy context: Israel targets 30% renewables by 2030 under acute land scarcity; ground-mounted PV is governed by Electricity Authority tenders and tariffs, and agricultural land is protected by planning law, so a national outline plan, not an energy law, is the vehicle for agriphotovoltaics.

Framework status: National Outline Plan 1, Amendment 24 (agriphotovoltaic installations) was approved by the National Planning and Building Council on 13 January 2026 and by the Government on 15 February 2026, led by the Planning Administration and the Ministry of Energy and Infrastructure: the country's first comprehensive rule set for agriphotovoltaics.

Policy design choice: Israel uses spatial planning and technical thresholds as the main regulatory tool: panel coverage at most 30% of cultivated area, at least 85% of the land kept in cultivation, output at least 75% of the regional crop standard, an agricultural appendix, control plots and Ministry of Agriculture monitoring, with exceptions possible through the Ministry.

Implementation provisions: Minimum panel clearance is 1.5 m for field crops and 4.5 m for orchards. Projects are prohibited in nature reserves, national parks, forests, beaches and streams, and ecological corridors must be preserved. Research programme: since February 2021 the Ministries of Energy and Agriculture have co-funded national agriphotovoltaic research (an initial ILS 3.5 m for six studies on orchards, field crops and greenhouses with the Gilat Research Center, the Hebrew University and Tel Aviv University), and the outline plan's research-plot rule feeds a monitoring network across Israel's climate zones.

Compliance: Four tracks by size: a fast track without a detailed plan up to 10 dunams (1 ha) on a holding's first plot; up to 80 dunams (8 ha) in localities with an agricultural quota and 150 dunams (15 ha) without; up to 1,000 dunams (100 ha) through a detailed plan. Projects above 300 dunams (30 ha) allocate a 15-dunam (1.5 ha) research plot for continuous data collection.

POLICY LESSON FOR ISA MEMBERS

Israel is a strong model for countries that want agriphotovoltaics to be spatially disciplined. It shows how to combine zoning, project-size thresholds, crop-specific height rules, environmental exclusions and monitoring plots.

Sources: NOP (TAMA) 1, Amendment 24, Council approval 13 January 2026, Government approval 15 February 2026; Planning Administration; Ministry of Energy and Infrastructure; Ministry of Agriculture; pv magazine (24 Feb 2026).

ASIA-PACIFIC

Australia

Australia does not yet have a dedicated agriphotovoltaic law, but it offers strong practical guidance on farmer-developer contracts, grazing design and landholder protection.

COUNTRY SNAPSHOT

FRAMEWORK

Guidance-led framework

POLICY / INSTRUMENT

No dedicated agriphotovoltaic law; practical deployment is guided by the NSW Agriphotovoltaics Handbook and Clean Energy Council Agrisolar Guide for landholders and developers.

DISTINCTIVE POLICY LEVER

Focuses on practical project design, grazing agreements, landholder decisions and solar-farm operations.

LESSON

Early markets should develop practical handbooks and contract guidance before mandating complex regulation.

KEY PROVISIONS

Policy purpose: Australia's agriphotovoltaics focus is to help large-scale solar coexist with farming, especially sheep grazing, cropping and horticulture. The NSW EnergyCo handbook is designed for landowners and solar developers navigating solar infrastructure on farmland.

Policy context: large-scale solar on rural land is driven by the national Renewable Energy Target and state renewable energy zones (for example NSW EnergyCo); land use and planning are state matters, so guidance rather than federal law fills the gap.

Framework status: Australia is currently a guidance-led model, not a dedicated statutory agriphotovoltaics framework. The Clean Energy Council's guide and NSW handbook provide practical guidance for farmers, landholders and developers.

Policy design choice: Australia's distinctive lever is contract and operations guidance. The NSW handbook covers sheep grazing, crop/horticulture opportunities,

grazing-agreement structures, infrastructure layout, access, water, paddock design and common mistakes.

Implementation provisions: Guidance highlights early landholder involvement in solar-farm design, specialist agricultural input, project layout decisions, grazing contracts and operational coordination between solar operators and farmers.

Compliance: Australia's current checks are mostly contractual and operational rather than regulatory. Queensland's agricultural analysis notes that developers may lack incentives to prioritise agriphotovoltaics if elevated or modified arrays cost more than conventional PV.

POLICY LESSON FOR ISA MEMBERS

Australia is useful for countries where large solar projects already exist on rural land. Before passing detailed laws, governments can issue practical landholder-developer guidelines covering contracts, grazing arrangements and farm operations.



Sources: state planning law applies; NSW EnergyCo Agrivoltaics Handbook (2025); Clean Energy Council, Australian Guide to Agrisolar; Queensland Department of Agriculture and Fisheries, agrivoltaic grazing systems report.

ASIA-PACIFIC

Vietnam

Vietnam is using pilots and technical groundwork to build an agriphotovoltaics framework before scaling.

COUNTRY SNAPSHOT

FRAMEWORK

Pilot-led framework

POLICY / INSTRUMENT

GIZ-MAE Agri-Photovoltaics for Rural Areas in Vietnam project, 2025–2027 is developing pilots, definitions, technical guidelines and financing pathways.

DISTINCTIVE POLICY LEVER

Starts with pilots, definitions, technical guidelines, feasibility tools and capacity building before national scale-up.

LESSON

Use pilots to build evidence, local design standards and farmer investment confidence before launching subsidies.

KEY PROVISIONS

Policy purpose: Vietnam aims to combine solar energy with farming to increase rural incomes, support the energy transition and reduce land-use competition between food and energy.

Policy context: Vietnam's 2017–2020 solar feed-in tariffs produced a boom and grid constraints; Power Development Plan 8 (2023) and land law restrict converting rice land, so agriphotovoltaics is being tested as a way to add solar without losing farmland.

Framework status: Vietnam is at an early but structured stage. The Agri-Photovoltaics for Rural Areas in Vietnam project runs from 2025 to 2027 and is implemented with GIZ and Vietnam's Ministry of Agriculture and Environment.

Policy design choice: Vietnam is building the policy base before scaling. The project will develop a strategy, standardised definition, technical guidelines, feasibility

database, advisory tools and financing capacity.

Implementation provisions: The project targets at least 10 pilot agriphotovoltaic models during 2025–2027 and aims to improve knowledge among policymakers and sector stakeholders.

Compliance: Since Vietnam is still pilot-led, compliance is not yet a formal statutory mechanism. The immediate priority is evidence generation: crop compatibility, business models, technical standards and farmer-friendly deployment models.

POLICY LESSON FOR ISA MEMBERS

Vietnam is useful for countries that are not ready for full legislation. Start with pilots, definitions, technical guidelines and feasibility tools, then move toward incentives and regulations once evidence is available.



Sources: Power Development Plan 8 (2023); Land Law (2024); GIZ, Agri-Photovoltaics for Rural Areas in Vietnam (2025–27); Ministry of Agriculture and Environment launch note; Vietnam News / VietnamPlus.

ASIA-PACIFIC

Thailand

Thailand is developing agriphotovoltaics policy recommendations across energy, agriculture and land-use systems before introducing a dedicated framework.

COUNTRY SNAPSHOT

FRAMEWORK

● Roadmap-led framework

POLICY / INSTRUMENT

No dedicated law yet; the IKI CASE agriphotovoltaics policy study provides recommended rules across agriculture, energy, land use, finance and standards.

DISTINCTIVE POLICY LEVER

Treats agriphotovoltaics as a cross-sector issue covering agriculture, energy, land-use, grid access and farmer economics.

LESSON

Build agriphotovoltaics policy through coordinated agriculture-energy-land rules, not as an energy policy alone.

KEY PROVISIONS

Policy purpose: Thailand is exploring agriphotovoltaics to increase agricultural yields, reduce farmer electricity costs, improve land-use efficiency and support renewable-energy deployment.

Policy context: PV is supported through feed-in schemes administered by the Energy Regulatory Commission under the Alternative Energy Development Plan; agricultural land, including reform land under ALRO, is governed by separate zoning, which is why the study spans energy, agriculture and land law.

Framework status: Thailand does not yet have a dedicated national agriphotovoltaics law. The CASE project (Clean, Affordable and Secure Energy for Southeast Asia), funded by Germany's International Climate Initiative (IKI) and implemented by GIZ, provides policy and regulatory recommendations for future implementation.

Policy design choice: Thailand's useful contribution is cross-sector policy design. The study proposes recommendations across agriculture, energy, land and

related sectors, recognising that agriphotovoltaics cannot be solved through electricity regulation alone.

Implementation provisions: Recommended areas include dual land-use recognition, financial incentives, integration into greenhouse-gas reduction plans, standards for agriphotovoltaic projects and support measures for farmers.

Compliance: Thailand's current gap is the absence of binding agriphotovoltaics standards and formal land-use rules. Future regulation will need project definitions, crop-design criteria, grid-access rules and farmer-benefit conditions.

POLICY LESSON FOR ISA MEMBERS

Thailand is useful for countries at the policy-design stage. Before launching pilots or subsidies, governments should map how agriculture law, land zoning, electricity regulation and financial incentives will interact.



Sources: CASE / GIZ (IKI-funded), Recommended Agri-PV Policies and Regulations for Thailand; CASE Southeast Asia policy report; focus-group materials on agrivoltaics regulation.

ASIA-PACIFIC · CASE STUDIES

Asia-Pacific case studies: case evidence and emerging policy considerations

What each case shows; single cases are evidence, not proven lessons

Policy trigger → Enabling instrument → Implementation model → Policy consideration

01

Japan

Allowing solar on farmland through time-bound permits

1 POLICY TRIGGER

Japan needed to expand solar while protecting scarce farmland and maintaining agricultural production.

2 ENABLING INSTRUMENT

MAFF enabled agriphotovoltaics through temporary farmland-conversion permits under the Agricultural Land Act, with continued cultivation required below panels.

3 IMPLEMENTATION MODEL

Projects operate as “solar sharing” systems, where removable structures are installed above crops and agricultural output is periodically reviewed.

4 POLICY CONSIDERATION

Use time-bound permits and yield checks to allow agriphotovoltaics without permanently converting agricultural land.

02

South Korea

Keeping agriphotovoltaics ownership with farmers

1 POLICY TRIGGER

South Korea needed a legal route for dual use of farmland while preventing external developers from capturing rural solar benefits.

2 ENABLING INSTRUMENT

Act on the Promotion and Support of Agriphotovoltaics: To be in force by 17 December 2026, implementing rules pending at the review cut-off.

3 IMPLEMENTATION MODEL

Operators limited to qualifying farmers, resident cooperatives and agricultural corporations; projects in Agricultural Promotion Zones only on designated Renewable Energy Zones

4 POLICY CONSIDERATION

Operator-eligibility rules can keep income and decision-making with farmers; results will show only once the Act is in force

03

Israel

Regulating agriphotovoltaics through clear zoning thresholds

1 POLICY TRIGGER

Israel needed to expand solar while protecting cultivated land, ecological corridors and sensitive landscapes.

2 ENABLING INSTRUMENT

The National Planning and Building Council approved a national outline plan for agriphotovoltaics in 2026, creating clear planning and design rules.

3 IMPLEMENTATION MODEL

The plan caps panel coverage at 30% of cultivated area, sets crop-specific panel heights and requires research plots for larger projects.

4 POLICY CONSIDERATION

Use zoning, height, coverage and monitoring thresholds to make agriphotovoltaics predictable for farmers, developers and regulators.

Sources: as on the Japan, South Korea and Israel profiles.



04 • COUNTRY POLICY PROFILES

Africa

8 country profiles

PROFILES AND LEAD FRAMEWORK

01	Morocco	Emerging
02	Egypt	Project-led
03	Tunisia	Pilot-led
04	Rwanda	Roadmap-led
05	Togo	Project-led
06	Mali	Pilot-led
07	The Gambia	Pilot-led
08	South Africa	Tender-led

AFRICA

Morocco

Morocco is positioning agriphotovoltaics as part of a wider food-energy-water strategy, especially for water-stressed agricultural regions.

COUNTRY SNAPSHOT

FRAMEWORK

Emerging

POLICY / INSTRUMENT

No dedicated agriphotovoltaic law yet; agriphotovoltaics is being explored through RES4Africa Mediterranean agriphotovoltaics analysis, renewable-energy policy and solar-powered agriculture initiatives.

DISTINCTIVE POLICY LEVER

Links agriphotovoltaics to water stress, agricultural productivity and renewable-energy targets rather than treating it only as solar deployment.

LESSON

Use agriphotovoltaics as a food-energy-water policy tool, especially in water-scarce, high-solar agricultural regions.

KEY PROVISIONS

Policy purpose: Morocco's agriphotovoltaics relevance comes from the convergence of high solar resource, agricultural water stress and national renewable-energy ambition. RES4Africa identifies Morocco as one of the Mediterranean countries where solar-agriculture co-location can address competing food, water and energy demands.

Policy context: Law 13-09 opened renewable generation to private producers; the Green Generation 2020–2030 strategy and solar-pump subsidies under the national irrigation water-saving programme support solar in agriculture. No agriphotovoltaic rule exists.

Framework status: Morocco does not yet have a dedicated agriphotovoltaic law, but it is part of regional policy analysis and has taken steps to support solar-powered agriculture, including support for solar irrigation pumps.

Policy design choice: Morocco's useful lesson is to frame agriphotovoltaics around agricultural competitiveness and water resilience. This is especially relevant for regions such

as Souss-Massa, where solar resource and intensive agriculture overlap.

Implementation provisions: Morocco can build on existing renewable-energy policy, solar-irrigation programmes and regional agricultural value chains to test agriphotovoltaic models linked to irrigation, post-harvest processing and climate-resilient farming.

Compliance: The main gap is the absence of dedicated agriphotovoltaics eligibility rules. Future regulation should define agricultural continuity, water-use performance, land-use status and decommissioning requirements.

POLICY LESSON FOR ISA MEMBERS

Morocco shows that agriphotovoltaics should not be designed only as a power-sector intervention. In arid and semi-arid countries, the case rests on water-efficient agriculture as much as on renewable energy.



Sources: Law 13-09 on renewable energy; Green Generation 2020–2030 strategy; RES4Africa Mediterranean agrivoltaics report; REN21; solar irrigation programme reporting.

AFRICA

Egypt

Egypt is testing agriphotovoltaics as a desert-farming and blended-finance model for arid land, water efficiency and rural livelihoods.

COUNTRY SNAPSHOT

FRAMEWORK

Project-led framework

POLICY / INSTRUMENT

No dedicated agriphotovoltaics regulation yet; the Egyptian Agriphotovoltaics Initiative and desert agriphotovoltaic pilots are building a governance, finance and evidence base.

DISTINCTIVE POLICY LEVER

Tests agriphotovoltaics in arid desert conditions with solar energy, water management, community resilience and monitoring.

LESSON

Use pilots to prove water savings, crop performance and investment viability before scaling into a national framework.

KEY PROVISIONS

Policy purpose: Egypt's agriphotovoltaics opportunity is linked to land reclamation, food security, solar expansion and water scarcity. Recent pilots focus on whether solar shading can reduce heat stress and water evaporation while supporting desert agriculture.

Policy context: renewables are supported through the 2014 feed-in tariff and build-own-operate tenders (Benban); desert land reclamation programmes frame agriculture on new land, and agriphotovoltaics is being tested inside those reclamation and blended-finance models.

Framework status: Egypt does not yet have a mature dedicated agriphotovoltaics regulation, but it has emerging pilot platforms and the Egyptian Agriphotovoltaics Initiative, which frames agriphotovoltaics through governance, blended finance and food-energy-water integration.

Policy design choice: Egypt's distinctive policy lever is desert proof-of-concept testing. A South Sinai pilot uses a 6 kWp agriphotovoltaic system for research and

demonstration, while a larger 100 kWp installation is under development in Al Moghra, Marsa Matrouh.

Implementation provisions: The pilot model combines solar PV, agriculture and water management, with planned monitoring of environmental conditions, energy production and agricultural performance through renewable-asset analytics.

Compliance: Egypt's immediate need is not a strict compliance regime, but credible evidence: water-use efficiency, crop productivity, land-use efficiency and commercial viability across multiple growing seasons.

WHAT THE PILOTS SHOW

desert-farming agriphotovoltaics with blended finance is being tested (Egyptian Agriphotovoltaics Initiative; 3E / ORG / Engazaat / Habiba Community pilot). Measured results on heat, water and yields are not yet published, so the policy implications remain open.



Sources: Renewable Energy Law 203/2014; Egyptian Agrivoltaics Initiative; 3E / ORG / Engazaat / Habiba Community pilot; Alexandria University Center of Excellence for Water; EnterpriseAM.

AFRICA

Tunisia

Tunisia is using research-led pilots to build national evidence before adopting a full agriphotovoltaics framework.

COUNTRY SNAPSHOT

FRAMEWORK

Pilot-led framework

POLICY / INSTRUMENT

ANME GIZ agriphotovoltaic pilot call and strategic analysis are testing agriphotovoltaics through research institutions, control plots and crop-water-energy monitoring.

DISTINCTIVE POLICY LEVER

Requires scientific testing across crops, water use, energy output and economic viability before scaling.

LESSON

Start with controlled pilots and research institutions where national data is missing.

KEY PROVISIONS

Policy purpose: Tunisia is exploring agriphotovoltaics to address two linked pressures: energy transition and agricultural adaptation under water scarcity and heat stress. ANME's pilot call frames agriphotovoltaics as a way to reduce evapotranspiration, improve irrigation efficiency and lower energy costs for farms.

Policy context: Law 2015-12 authorises renewable self-generation and concession projects; ANME (Agence nationale pour la maîtrise de l'énergie) runs the national solar programmes, so the pilot call sits inside ANME's energy mandate rather than in agricultural law.

Framework status: Tunisia does not yet have a mature agriphotovoltaic law, but it has launched a structured pilot process led by the National Agency for Energy Management, supported by GIZ and strategic analysis work.

Policy design choice: Tunisia's distinctive approach is to use public research institutes and agricultural training centres as pilot hosts. This helps generate credible national evidence before policy scale-up.

Implementation provisions: The call allows fixed or mobile solar canopies, semi-transparent PV greenhouses and vertical PV systems, while excluding simple rooftops and large ground-mounted grazing projects. It also requires cultivated land and control plots for comparison.

Compliance: Tunisia's pilot design includes crop-performance testing, water-use assessment, energy-balance measurement and economic viability analysis.

WHAT THE PILOT SHOWS

a structured national pilot call with control plots (ANME, with GIZ support) is a credible way to generate local evidence; conclusions about standards must wait for results.



Sources: Law 2015-12 on electricity generation from renewable sources; ANME pilot call and project specifications; GIZ strategic analysis; ANME / TETA project references.

AFRICA

Rwanda

Rwanda is developing agriphotovoltaics through a roadmap-led approach focused on drought-prone areas, land scarcity and climate-resilient agriculture.

COUNTRY SNAPSHOT

FRAMEWORK

Roadmap-led framework

POLICY / INSTRUMENT

GGGI-MINAGRI agriphotovoltaics preliminary study and roadmap provide the basis for pilot deployment in drought-prone and land-constrained agricultural areas.

DISTINCTIVE POLICY LEVER

Uses national stakeholder validation to identify suitable sites, crops and implementation pathway before pilot deployment.

LESSON

Build government ownership early through a validated roadmap, not isolated donor-led pilots.

KEY PROVISIONS

Policy purpose: Rwanda is considering agriphotovoltaics to address land scarcity, drought exposure, rain-fed agriculture vulnerability and the need for clean energy in irrigation and post-harvest activities.

Policy context: Rwanda's energy policy targets universal access with off-grid solar, and MINAGRI's crop-intensification and irrigation programmes govern land use; the roadmap aligns agriphotovoltaics with both agendas before any project is built.

Framework status: Rwanda is at the roadmap and pilot-preparation stage. GGGI Rwanda and MINAGRI validated a preliminary agriphotovoltaics study and co-created a roadmap for pilot implementation in 2024.

Policy design choice: Rwanda's distinctive lever is institutional validation. The country is not jumping directly to subsidies or regulation; it is first building a country-

specific evidence base, stakeholder alignment and pilot roadmap.

Implementation provisions: The programme is linked to Rwanda's climate-resilient agriculture priorities, solar irrigation, water management, renewable energy integration and drought-prone areas, particularly in the eastern province.

Compliance: Rwanda's current need is pilot monitoring: crop response, water and energy savings, market profitability, farmer acceptance and technical-management capacity.

WHAT THE ROADMAP SHOWS

a validated preliminary study and roadmap²⁹; identify suitable zones before deployment; no project has been built yet, so no lesson beyond the sequencing itself can be drawn.



Sources: ²⁹ GGGI Rwanda preliminary agrivoltaics study and roadmap validation with MINAGRI (2024); National Energy Policy; MINAGRI / RAB preparatory project.

AFRICA

Togo

Togo provides one of Africa's clearest examples of a grid-connected agriphotovoltaic project combining electricity, vegetable production and drip irrigation.

COUNTRY SNAPSHOT

FRAMEWORK

Project-led framework

POLICY / INSTRUMENT

No dedicated agriphotovoltaic law yet; the Dalavé agriphotovoltaic plant by atmosfair and SUNtec is the country's first commercial demonstrator using solar, crops and drip irrigation.

DISTINCTIVE POLICY LEVER

Combines agriphotovoltaics with drip irrigation, vegetable production, grid electricity and Article 6 carbon-finance logic.

LESSON

Use early commercial demonstrators to prove that agriphotovoltaics can deliver food, power and climate-finance value together.

KEY PROVISIONS

Policy purpose: Togo's agriphotovoltaics opportunity is linked to electricity access, imported power dependence, agricultural productivity and rural development. The Dalavé plant is presented as Togo's first agriphotovoltaic system.

Policy context: Togo's electrification strategy (CIZO solar kits, mini-grids) and the rural electrification agency AT2ER shape the market; the Dalavé project is grid-connected under the national utility, which is what makes it unusual in the region.

Framework status: Togo does not yet have a dedicated agriphotovoltaic law, but it has moved beyond pure feasibility through an implemented project and a broader regional pre-feasibility initiative with the Democratic Republic of the Congo, Guinea and Senegal.

Policy design choice: Togo's distinctive lever is commercial demonstration linked to climate finance. The Dalavé system uses partial shade for vegetable production,

drip irrigation and renewable electricity fed into the grid.

Implementation provisions: The plant uses around 4,800 solar panels and is expected to generate about 3,000 MWh of electricity annually once connected, while vegetables are cultivated below the panels with efficient irrigation. Atmosfair plans six agriphotovoltaic systems in total.

Compliance: Togo's project demonstrates practical monitoring needs: crop productivity, irrigation performance, grid generation, emissions reduction and farmer/community benefits.

WHAT THE PROJECT SHOWS

a grid-connected agriphotovoltaic project (Dalavé) can combine electricity, vegetable production and drip irrigation; whether it is replicable at policy scale depends on tariff, land and finance rules that are not yet in place.



Sources: atmosfair, Dalavé agrivoltaics project; SUNtec Togo; Climate Technology Centre and Network (CTCN), West and Central Africa agrivoltaics feasibility project.

AFRICA

Mali

Mali is part of the APV-MaGa model, which tests triple land use: food production, solar electricity and water management.

COUNTRY SNAPSHOT

FRAMEWORK

 Pilot-led framework

POLICY / INSTRUMENT

APV-MaGa project by Fraunhofer ISE and partners tests agriphotovoltaics as a food-energy-water demonstrator for Sahelian conditions.

DISTINCTIVE POLICY LEVER

Tests agriphotovoltaics as a food-energy-water system, not simply a solar-plus-crop installation.

LESSON

In arid regions, agriphotovoltaic pilots should integrate water harvesting and irrigation from the beginning.

KEY PROVISIONS

Policy purpose: Mali's agriphotovoltaics test case is designed for hot, semi-arid West African conditions where food, energy and water security are linked. The APV-MaGa project aims to prove the technical and economic viability of integrated food, energy and water systems.

Policy context: rural electrification in Mali runs through the agency AMADER and off-grid programmes; the APV-MaGa demonstrator operates as a research site outside any PV support scheme.

Framework status: Mali does not yet have a national agriphotovoltaics policy framework, but it has a major R&D demonstrator under APV-MaGa, involving Malian research institutions and international partners.

Policy design choice: Mali's distinctive policy learning is triple land use. The model combines crops, solar electricity and water collection/storage through the PV infrastructure.

Implementation provisions: APV-MaGa includes a planned 200 kWp demonstrator on approximately one hectare in Katibougou, Mali, with business-model analysis around energy and agricultural revenue.

Compliance: The demonstrator is designed to collect technical, agricultural, socio-economic and environmental evidence, including interactions across the food-water-energy nexus.

WHAT THE PILOT SHOWS

the APV-MaGa demonstrator tests triple use (food, power, water) under Sahelian conditions; results on water capture and drought resilience are the evidence to watch. Transfer of European crop-shading designs is untested here.



Sources: APV-MaGa project (Fraunhofer ISE; German Federal Ministry of Education and Research, CLIENT II / FONA3); United Nations University (UNU); Climate Chance.

AFRICA

The Gambia

The Gambia uses APV-MaGa to test community-level agriphotovoltaic models, including rainwater harvesting, cold storage and farmer-managed services.

COUNTRY SNAPSHOT

FRAMEWORK

Pilot-led framework

POLICY / INSTRUMENT

APV-MaGa project supports community-level agriphotovoltaic demonstrators with rainwater harvesting, drip irrigation, cold storage and rural services.

DISTINCTIVE POLICY LEVER

Tests multiple site types, including community gardens, cold storage and rainwater harvesting.

LESSON

Design agriphotovoltaics around rural services, not only electricity sales.

KEY PROVISIONS

Policy purpose: The Gambia's agriphotovoltaic pilots are designed to strengthen rural resilience by combining electricity generation, farming, irrigation support, cold storage and community-level value creation.

Policy context: The Gambia's Renewable Energy Act (2013) and the NAWEC grid frame the power sector; the APV-MaGa sites run as off-grid community systems serving irrigation and cooling.

Framework status: The Gambia is not yet a regulation-led country, but it has one of Africa's most structured agriphotovoltaics demonstration programmes through APV-MaGa.

Policy design choice: The Gambia's distinctive lever is community service integration. APV-MaGa includes several demonstrator types, including systems linked to rainwater

harvesting, transformation platforms and cold storage for food preservation.

Implementation provisions: Fraunhofer ISE notes that four demonstrators are planned in The Gambia, each tailored to local needs. Field reporting from UNU describes V-shaped solar panel arrangements designed to collect rainwater and shade crops, with drip irrigation and sensor-based monitoring.

Compliance: The project uses field data, community interaction, sensors, irrigation data and reference plots to understand how agriphotovoltaics performs in practice.

WHAT THE PILOT SHOWS

APV-MaGa community sites test agriphotovoltaics as a rural-services platform (irrigation, cooling, processing); the evidence is early and site-specific.



Sources: Renewable Energy Act (2013); APV-MaGa project (Fraunhofer ISE); UNU field reporting; UN Innovation Network; Climate Chance.

AFRICA

South Africa

South Africa is emerging as a practical agriphotovoltaics market where provincial procurement, private solar growth and agricultural land-use potential are beginning to converge.

COUNTRY SNAPSHOT

FRAMEWORK

Tender-led framework

POLICY / INSTRUMENT

No dedicated national agriphotovoltaic law yet; Mpumalanga's agriphotovoltaics tender and national renewable-energy market reforms provide an emerging provincial procurement route.

DISTINCTIVE POLICY LEVER

Uses public agricultural assets such as agrihubs, agriparks and fresh-produce markets as entry points for agriphotovoltaics deployment.

LESSON

Start agriphotovoltaics through public agricultural infrastructure where energy demand, farmer services and land availability already exist.

KEY PROVISIONS

Policy purpose: South Africa's agriphotovoltaics opportunity is linked to three pressures: unreliable electricity supply for agriculture, rising private solar deployment and the need to use agricultural land more productively without displacing farming. Mpumalanga's agriphotovoltaics tender explicitly aims to reduce reliance on unstable local power supply at agricultural properties.

Policy context: utility PV is procured through REIPPPP bid windows and, since the 2022 licensing exemption, private generation; the Mpumalanga tender uses public agricultural infrastructure as a site. No agriphotovoltaic national rule exists.

Framework status: South Africa does not yet have a dedicated national agriphotovoltaic law. However, it has an active renewable-energy market framework through REIPPPP, private-generation regulation and broader renewable-energy policy reforms. The South African Renewable Energy Masterplan also supports renewable-energy and storage value-chain development by 2030.

Policy design choice: South Africa's distinctive lever is provincial procurement using agricultural infrastructure. In 2025, Mpumalanga province launched a tender seeking developers to establish, manage and operate

agripotovoltaics across selected sites, including agrihubs, agriparks and fresh-produce markets. This places agriphotovoltaics on specific public sites.

Implementation provisions: The Mpumalanga tender identifies opportunities across primary and secondary produce sites and agro-processing infrastructure. This is important because agriphotovoltaics can be linked not only to crop shading, but also to cold rooms, irrigation, grading, packing, storage and market operations.

Compliance: South Africa's current gap is the absence of agriphotovoltaic eligibility and monitoring rules. Future policy should define agricultural continuity, land-use status, farmer participation, grid/offtake rules, crop or grazing compatibility, and environmental approval requirements. South Africa's existing environmental and electricity regulatory architecture can provide the base for this.

POLICY LESSON FOR ISA MEMBERS

South Africa shows a practical route for countries that already have large solar markets but no agriphotovoltaic law. Governments can begin by using public agricultural infrastructure as demonstration sites, while developing national rules on land use, farming continuity and farmer benefit-sharing.

Sources: Electricity Regulation Act (licensing exemption, 2022); REIPPPP; Department of Forestry, Fisheries and the Environment (DFFE) environmental authorisation rules; Mpumalanga agrivoltaics tender; South African Renewable Energy Masterplan; South African Photovoltaic Industry Association (SAPVIA); Stellenbosch University GIS analysis.

AFRICA • CASE STUDIES

Africa case studies: case evidence and emerging policy considerations

What each case shows; single cases are evidence, not proven lessons

Policy trigger → Enabling instrument → Implementation model → Policy consideration

01

Tunisia

Testing agriphotovoltaics through research-led pilots

1 POLICY TRIGGER

Tunisia needed to test whether agriphotovoltaics could support energy transition while reducing water stress and improving climate resilience in agriculture.

2 ENABLING INSTRUMENT

ANME, with GIZ support, launched a structured pilot call for public research institutes and agricultural training centres

3 IMPLEMENTATION MODEL

The pilot call requires cultivated land, control plots, crop-performance assessment, water-use evaluation, energy-output measurement and economic analysis

4 POLICY CONSIDERATION

A structured pilot call with control plots is a credible way to build local evidence; conclusions about standards must wait for results

02

Rwanda

Building an agriphotovoltaics roadmap before deployment

1 POLICY TRIGGER

Rwanda needed a land-efficient response to drought exposure, rain-fed agriculture vulnerability and limited rural energy access.

2 ENABLING INSTRUMENT

GGGI Rwanda, MINAGRI and national stakeholders validated a preliminary agriphotovoltaics study and co-created a roadmap for pilot implementation.

3 IMPLEMENTATION MODEL

The roadmap focuses on site suitability, crop selection, water-energy-food benefits and pilot design for drought-prone agricultural areas.

4 POLICY CONSIDERATION

A validated roadmap can identify suitable zones before deployment; no project has been built yet, so the sequencing is the only lesson so far.

03

Togo

Proving agriphotovoltaics through a commercial demonstrator

1 POLICY TRIGGER

Togo needed to reduce power-import dependence while protecting agricultural land and improving rural productivity.

2 ENABLING INSTRUMENT

The Dalavé project combined private project development, grid connection and climate-finance logic, with emissions reductions structured under Article 6.4 of the Paris Agreement

3 IMPLEMENTATION MODEL

The plant uses solar panels above vegetable production with drip irrigation, while feeding renewable electricity into the Togolese grid.

4 POLICY CONSIDERATION

One grid-connected project shows food, power and irrigation can combine; replication needs tariff, land and finance rules not yet in place.

Sources: as on the Tunisia, Rwanda and Togo profiles.



04 • COUNTRY POLICY PROFILES

Latin America & the Caribbean

8 country profiles

PROFILES AND LEAD FRAMEWORK

01	Brazil	☒ Emerging
02	Chile	☒ Pilot-led
03	Colombia	☒ Pilot-led
04	Argentina	☒ Emerging
05	Barbados	☒ Project-led
06	Cuba	☒ Emerging
07	Jamaica	☒ Pilot-led
08	Dominican Republic	☒ Project-led

LATIN AMERICA & THE CARIBBEAN

Brazil

Brazil has strong agricultural and solar potential, but its key policy need is a national agriphotovoltaics definition and regulatory pathway.

COUNTRY SNAPSHOT

FRAMEWORK

Emerging

POLICY / INSTRUMENT

No dedicated agriphotovoltaic law yet; GIZ Brazil agriphotovoltaics study, Distributed Generation Law No. 14,300/2022 and existing solar rules provide the base for future regulation.

DISTINCTIVE POLICY LEVER

Uses feasibility studies and pilot evidence to inform future national regulation.

LESSON

Large agricultural economies should first define minimum agriphotovoltaics criteria before scaling incentives.

KEY PROVISIONS

Policy purpose: Brazil's agriphotovoltaics opportunity lies in combining its large agricultural base with strong solar resources, while supporting rural energy autonomy and farmer income diversification. GIZ notes that agriphotovoltaics in Brazil is still in the pilot implementation phase and needs adaptation to local agricultural and climatic conditions.

Policy context: Law 14,300/2022 governs distributed generation and ANEEL regulates grid access; rural land is governed by the Forest Code and rural property registration. With no definition of agriphotovoltaics, projects use distributed-generation rules.

Framework status: Brazil does not yet have a dedicated agriphotovoltaic law or ANEEL-specific agriphotovoltaics regulation; projects currently rely on general solar, distributed generation, environmental and rural land rules.

Policy design choice: Brazil's distinctive learning is regulatory preparation. Recent research recommends minimum agriphotovoltaics criteria, regional parameters and stakeholder engagement to shape future national regulation.

Implementation provisions: Brazil's Distributed Generation Law No. 14,300/2022 can support smaller farmer-linked solar systems, while larger projects follow centralised generation licensing and environmental rules.

Compliance: Brazil's future framework should clarify crop continuity, land-use status, smallholder eligibility, environmental licensing and how agriphotovoltaics differs from conventional ground-mounted solar.

POLICY LESSON FOR ISA MEMBERS

Brazil shows that high potential is not enough. Countries need clear definitions, regional design criteria and farmer-oriented business models before scaling agriphotovoltaics.



Sources: Federal Law No. 14,300/2022 (distributed generation); ANEEL regulations; GIZ Brazil agrivoltaics factsheet and techno-economic study; CMS Brazil guide; AgriVoltaics Conference 2025 Brazil regulation paper.

LATIN AMERICA & THE CARIBBEAN

Chile

Chile is building the policy case for agriphotovoltaics through pilots, policy briefs and water-stress-driven agricultural adaptation.

COUNTRY SNAPSHOT

FRAMEWORK

Pilot-led framework

POLICY / INSTRUMENT

No dedicated agriphotovoltaic law yet; Fraunhofer Chile pilots and the GIZ-Chile USM agriphotovoltaics policy brief provide recommendations for future legal and financial rules.

DISTINCTIVE POLICY LEVER

Links agriphotovoltaics to water scarcity, crop protection and distributed solar generation.

LESSON

Use agriphotovoltaics as an adaptation tool for water-stressed agriculture, not only as a renewable-energy technology.

KEY PROVISIONS

Policy purpose: Chile's agriphotovoltaics relevance is driven by climate variability, water scarcity and the need to protect high-value agricultural production while expanding solar energy. The GIZ-Chile policy brief frames agriphotovoltaics as a tool for food security, water security, climate resilience and distributed renewable energy.

Policy context: small solar is underpinned by the PMGD distributed-generation regime with a stabilised price and the net-billing law 20,571; water scarcity drives agricultural interest. No legal definition of agriphotovoltaics exists.

Framework status: Chile does not yet have a dedicated agriphotovoltaics legal framework, but it has several pilots and policy recommendations. A 2025 regulatory analysis identified nine implemented agriphotovoltaic projects and noted barriers including lack of legal definition, land-use constraints and limited mechanisms to monetise agricultural and environmental benefits.

Policy design choice: Chile's distinctive lever is local evidence generation. Fraunhofer Chile has implemented pilot plants in Curacaví, El Monte and Lampa since 2018,

each with 13 kWp capacity, to test crop-energy synergies under local conditions.

Implementation provisions: Chilean pilots test crop shading, soil moisture, evapotranspiration, frost and hail protection, and irrigation-energy integration. A cherry orchard pilot in Teno uses elevated solar panels with tracking and compares crop response against a control area.

Compliance: Chile's next step is to convert pilot evidence into a formal definition, land-use rules, R&D funding and inter-ministerial coordination across agriculture, energy, irrigation and environment agencies.

POLICY LESSON FOR ISA MEMBERS

Chile shows how countries can use agriphotovoltaics to protect water-stressed crops. Policy should begin with local pilots and then define crop-specific technical rules.



Sources: Law 20,571 (net billing); PMGD regime; Fraunhofer Chile agrivoltaic pilots; GIZ Chile / Fraunhofer / Universidad Técnica Federico Santa María (USM) policy brief; 2025 regulatory analysis; University of Chile cherry orchard pilot.

LATIN AMERICA & THE CARIBBEAN

Colombia

Colombia is emerging as one of LAC's strongest agriphotovoltaics references through inclusive pilots, community-based models and a large just-energy-transition programme.

COUNTRY SNAPSHOT

FRAMEWORK

Pilot-led framework

POLICY / INSTRUMENT

No dedicated agriphotovoltaic law yet; Law 1715 renewable-energy framework and the IKI-funded JET-AgriSOL programme support inclusive agriphotovoltaic pilots and policy learning.

DISTINCTIVE POLICY LEVER

Uses agriphotovoltaics for climate resilience, rural livelihoods, food security and just energy transition.

LESSON

Design agriphotovoltaics for inclusion from the start, especially for rural, vulnerable and energy-poor communities.

KEY PROVISIONS

Policy purpose: Colombia's agriphotovoltaics agenda targets climate resilience, food security, rural energy access and low farm incomes. The JET-AgriSOL project explicitly links agriphotovoltaics with a just energy transition and rural development.

Policy context: Law 1715/2014 gives tax incentives for renewables and Law 2099/2021 widens them; energy communities (2023) and the just-energy-transition programme frame agriphotovoltaics as an inclusion tool rather than a land-use rule.

Framework status: Colombia does not yet have a dedicated agriphotovoltaics regulation, but Law 1715 provides a renewable-energy framework that can support solar projects, self-generation and energy communities.

Policy design choice: Colombia's distinctive lever is inclusive programme design. JET-AgriSOL will deploy APV systems across diverse agroclimatic zones, prioritising

women, Indigenous Peoples and Local Communities, producer associations and agribusiness partnerships.

Implementation provisions: Colombia already has small-scale agriphotovoltaic pilots, including a SOLENIUM project in San Diego, Cesar, testing melon and watermelon in a tropical dry forest context.

Compliance: Colombia's future framework should define project eligibility, agricultural performance, community benefit-sharing, environmental approvals and finance models for inclusive agriphotovoltaics deployment.

POLICY LESSON FOR ISA MEMBERS

Colombia is useful for countries that want agriphotovoltaics to support vulnerable rural communities, not only commercial developers. The key lesson is to link agriphotovoltaics with inclusion, skills, finance and community ownership.



Sources: Law 1715/2014; Law 2099/2021; IKI-funded JET-AgriSOL project; Alliance of Bioversity International and CIAT; CMS Colombia guide; tropical dry forest pilot study; water-energy-food nexus research.

LATIN AMERICA & THE CARIBBEAN

Argentina

Argentina's strongest agriphotovoltaics learning is sector-specific: applying solar-agriculture integration to vineyards and livestock-oriented rural systems.

COUNTRY SNAPSHOT

FRAMEWORK

Emerging

POLICY / INSTRUMENT

No dedicated agriphotovoltaics policy yet; renewable-energy policy and viticulture-focused agriphotovoltaics research provide the basis for crop-specific pilots.

DISTINCTIVE POLICY LEVER

Positions agriphotovoltaics as a tool for vineyards and agricultural value chains exposed to high solar radiation and irrigation pressure.

LESSON

Use sector-specific pilots, such as vineyards, before attempting broad national agriphotovoltaics regulation.

KEY PROVISIONS

Policy purpose: Argentina's agriphotovoltaics opportunity lies in combining renewable energy with agriculture and livestock systems, especially in regions where high solar radiation and irrigation stress affect production.

Policy context: RenovAr auctions (2016–19) under Law 27,191 drove utility renewables and Law 27,424 enables distributed generation; provincial land and viticulture rules apply. Agriphotovoltaics is not recognised in any of them.

Framework status: Argentina has renewable-energy policy development, but agriphotovoltaics is not yet specifically recognised in the regulatory framework. Research on viticulture across Argentina, Chile and South Africa notes that agriphotovoltaics is still not explicitly mentioned despite renewable-energy policy advances.

Policy design choice: Argentina's distinctive learning is sector targeting. Instead of starting with a generic agriphotovoltaic law, the country can test models

in vineyards, livestock shading and rural self-consumption systems.

Implementation provisions: Viticulture-focused studies suggest that solar integration can reduce long-term production costs and support climate adaptation, but limited local field experience remains a barrier to wider adoption.

Compliance: Future pilots should measure grape quality, irrigation demand, microclimate effects, machinery access, farmer acceptance and whether energy revenue improves farm resilience.

POLICY LESSON FOR ISA MEMBERS

Argentina shows that agriphotovoltaics can be introduced by priority sectors. For countries with high-value crops, start with crop-specific evidence rather than a broad one-size-fits-all regulation.



Sources: Law 27,191 (renewables); Law 27,424 (distributed generation); AgriVoltaics 2022 viticulture study (Argentina, Chile, South Africa); Argentina agrivoltaics opportunity commentary.

LATIN AMERICA & THE CARIBBEAN

Barbados

Barbados offers a strong land-constrained island model where agriphotovoltaics supports both renewable-energy transition and continued agricultural use.

COUNTRY SNAPSHOT

FRAMEWORK

Project-led framework

POLICY / INSTRUMENT

No dedicated agriphotovoltaic law yet; agriphotovoltaic pilots and dual-use solar projects align with Barbados' 100% renewable-energy transition ambition and land-efficiency needs.

DISTINCTIVE POLICY LEVER

Uses agriphotovoltaics to address scarce land, hurricane-prone conditions and fossil-fuel import dependence.

LESSON

Small islands should make dual-use solar a core land-efficiency strategy, not a niche project.

KEY PROVISIONS

Policy purpose: Barbados has limited land and high dependence on imported fossil fuels, making dual-use renewable-energy models especially relevant. The country has a policy ambition to move toward 100% renewables by 2030.

Policy context: the Barbados National Energy Policy 2019–2030 targets 100% renewables by 2030; a feed-in tariff for PV and scarce land push dual use. No agriphotovoltaic rule exists.

Framework status: Barbados does not have a dedicated agriphotovoltaic law, but it has practical agriphotovoltaic installations and dual-use solar project concepts.

Policy design choice: Barbados' distinctive lever is climate- and island-adapted engineering. The Grace Solar project uses design features suited to coastal, humid, high-

salt and high-wind conditions, including reinforced structures and anti-corrosion treatment.

Implementation provisions: Barbados agriphotovoltaics work reportedly includes a 1 MW pilot at Cave Plantation, project design work for larger sites, and solar-agriculture integration on sugarcane land.

Compliance: Barbados should focus on cyclone/wind resilience, corrosion standards, agricultural continuity, land-use efficiency and farmer participation in project economics.

WHAT THE PROJECTS SHOW

dual-use installations on a land-scarce island must be engineered for hurricanes, corrosion and crop access; no policy framework has yet been tested around them.



Sources: Barbados National Energy Policy 2019–2030; Grace Solar Barbados agrivoltaics project; Renewable Barbados dual-use land concept.

LATIN AMERICA & THE CARIBBEAN

Cuba

Cuba's relevance is less about formal agriphotovoltaics regulation and more about linking solar energy with rural resilience, local development and food security.

COUNTRY SNAPSHOT

FRAMEWORK

Emerging

POLICY / INSTRUMENT

No dedicated agriphotovoltaics framework yet; EU-Cuba agriphotovoltaic exchange and farmer-facing solar projects are building a rural solar-agriculture pathway.

DISTINCTIVE POLICY LEVER

Uses solar energy to strengthen irrigation, local food production and rural resilience under energy insecurity.

LESSON

Start with farmer-facing solar for irrigation and local food systems, then evolve toward agriphotovoltaics co-location where suitable.

KEY PROVISIONS

Policy purpose: Cuba faces energy insecurity, power outages and climate stress affecting small farmers. IFAD reports that solar panels have helped farmers in Holguín irrigate crops despite unreliable grid electricity.

Policy context: Decree-Law 345/2017 promotes renewable sources within a state-owned power sector; donor programmes (EU, IFAD) fund solar in agriculture, and agriphotovoltaics appears only in cooperation projects.

Framework status: Cuba does not yet have a dedicated agriphotovoltaics framework, but EU-Cuba cooperation has discussed agriphotovoltaic energy as a tool for local development, food production and renewable-energy integration.

Policy design choice: Cuba's distinctive learning is rural resilience first. The initial policy bridge is not large solar parks but solar access for farmers, irrigation, post-harvest reliability and food-security support.

Implementation provisions: Cuba's broader national energy transition strategy includes increasing solar PV in the electricity matrix and reducing dependence on expensive diesel fuel.

Compliance: not applicable; there is no agriphotovoltaic framework or project-level rule to comply with yet.

WHAT THE COOPERATION SHOWS

EU-Cuba and IFAD projects link solar with rural resilience and food security; there is no agriphotovoltaic project evidence yet from which to draw policy lessons.



Sources: Decree-Law 345/2017 on renewable sources; FIAP EU-Cuba agrivoltaic energy exchange; International Fund for Agricultural Development (IFAD) rural solar resilience case; Cuba energy transition reporting.

LATIN AMERICA & THE CARIBBEAN

Jamaica

Jamaica provides a small-island agriphotovoltaics demonstration model linked to education, campus energy use and Caribbean technology transfer.

COUNTRY SNAPSHOT

FRAMEWORK

Pilot-led framework

POLICY / INSTRUMENT

No dedicated agriphotovoltaics policy yet; a 50 kWp agriphotovoltaic farm at the College of Agriculture, Science and Education acts as an education and demonstration platform.

DISTINCTIVE POLICY LEVER

Uses an agricultural college as a demonstration, training and technology-transfer site.

LESSON

Evidence so far: an agricultural college works as a first testbed; policy lessons await a national programme.

KEY PROVISIONS

Policy purpose: Jamaica's agriphotovoltaic pilot addresses food security, renewable-energy production and rural innovation. The first agriphotovoltaic farm was launched through a partnership between JPS, East-West Power Korea, JPS Foundation and the College of Agriculture, Science and Education.

Policy context: the National Energy Policy 2009–2030 and the integrated resource plan target 50% renewables by 2030; JPS is the licensed utility and small-scale net billing exists. No agriphotovoltaic rule exists.

Framework status: Jamaica does not yet have a dedicated agriphotovoltaics policy, but it has a practical demonstration project. The 50 kWp farm is being implemented in phases from March 2024 to February 2026.

Policy design choice: Jamaica's distinctive lever is education-led deployment. The project is located at the College, allowing student training, technology learning and

local business-model development.

Implementation provisions: The project aims to provide renewable energy for the College campus, support agricultural products, strengthen Caribbean agriphotovoltaic technology knowledge and reduce diesel-related environmental issues.

Compliance: not applicable; no regulatory framework exists, the project runs under JPS's licence on college land.

WHAT THE PILOT SHOWS

a single 50 kWp campus pilot cannot carry policy-design conclusions. It shows that a small island utility, a foreign partner and an agricultural college can set up a demonstration and training site at low cost; whether the model scales, and what rules it would need, is untested.



Sources: Electricity Act 2015; National Energy Policy 2009–2030; Jamaica Public Service (JPS) announcement; JPS Foundation / East-West Power Korea / College of Agriculture, Science and Education project information.

LATIN AMERICA & THE CARIBBEAN

Dominican Republic

The Dominican Republic is one of the clearest Caribbean examples of a concession-backed agro-energy project.

COUNTRY SNAPSHOT

FRAMEWORK

Project-led framework

POLICY / INSTRUMENT

National Energy Commission concession granted to SUNfarming for a 50 MW Food & Energy agro-solar project, creating a concession-backed agriphotovoltaics route.

DISTINCTIVE POLICY LEVER

Uses a formal energy concession to enable a grid-connected agriphotovoltaic project.

LESSON

Island states can use concession frameworks to attract private agriphotovoltaics investment while supporting food-energy resilience.

KEY PROVISIONS

Policy purpose: The Dominican Republic's agriphotovoltaics relevance comes from energy-import dependence, renewable-energy expansion and the opportunity to combine land-based solar with agricultural production.

Policy context: Law 57-07 gives tax incentives for renewables and the National Energy Commission (CNE) grants provisional and definitive concessions; the SUNfarming concession uses this general route with no agriphotovoltaic conditions.

Framework status: The country has granted a definitive concession for a 50 MW agro-energy solar PV complex to SUNfarming in Peravia province, making it one of the more concrete agriphotovoltaic style developments in LAC.

Policy design choice: The distinctive lever is concession-backed project development. Rather than only using pilots, the National Energy Commission concession provides a

formal route for a grid-connected agro-energy project.

Implementation provisions: SUNfarming's project is described as part of its Food & Energy concept, combining photovoltaic energy production with agricultural activity and local development objectives.

Compliance: The key policy need is to ensure that the agricultural component is clearly defined, monitored and not treated as a secondary narrative attached to a conventional solar project.

WHAT THE CONCESSION SHOWS

a 50 MW agro-energy complex can be licensed through the ordinary concession route; whether agriculture is maintained depends on obligations the concession does not yet contain.



Sources: Law 57-07 on renewable energy incentives; CNE definitive concession; SUNfarming Food & Energy project; IRENA Dominican Republic renewable-energy prospects; GGGI solar-storage project.

LATIN AMERICA & THE CARIBBEAN • CASE STUDIES

Latin America and the Caribbean case studies: case evidence and emerging policy considerations

What each case shows; single cases are evidence, not proven lessons

Policy trigger → Enabling instrument → Implementation model → Policy consideration

01

Chile

Using pilots to shape future agriphotovoltaics policy

1 POLICY TRIGGER

Chile needed to address water scarcity, crop protection and renewable-energy expansion in agricultural regions.

2 ENABLING INSTRUMENT

Fraunhofer Chile pilots and the GIZ-Chile Energy Partnership policy brief created the evidence base for agriphotovoltaics policy recommendations.

3 IMPLEMENTATION MODEL

Pilots in Curacaví, El Monte and Lampa tested crop-energy synergies, while newer pilots are assessing shading, irrigation, crop quality and energy self-consumption.

4 POLICY CONSIDERATION

Local pilots can inform crop-specific design rules before a national framework is drafted; the evidence is still site-specific.

02

Dominican Republic

Enabling agriphotovoltaics through an energy concession

1 POLICY TRIGGER

The Dominican Republic needed to expand renewable energy while reducing fossil-fuel import dependence and improving rural development outcomes.

2 ENABLING INSTRUMENT

The National Energy Commission granted SUNfarming a definitive concession for a 50 MW agro-energy solar project

3 IMPLEMENTATION MODEL

SUNfarming's Food & Energy concept combines grid-connected PV with agricultural activity and local development in Peravia province, licensed through the general concession route under Law 57-07.

4 POLICY CONSIDERATION

Ordinary energy concessions can license agro-energy projects quickly, but agricultural obligations and monitoring must be written into the concession terms.

03

Colombia

Designing agriphotovoltaics for inclusive rural development

1 POLICY TRIGGER

Colombia needed to support a just energy transition while improving rural livelihoods, food security and climate resilience

2 ENABLING INSTRUMENT

The IKI-funded JET-AgriSOL programme provides a structured platform for inclusive agriphotovoltaic pilots, skills development, finance tools and policy learning.

3 IMPLEMENTATION MODEL

The programme tests agriphotovoltaics across diverse climates through community and commercial pilots, prioritising women, indigenous peoples and local producers.

4 POLICY CONSIDERATION

The programme tests whether linking technology with finance, skills and community ownership makes agriphotovoltaics inclusive; results are still to come.

Sources: as on the Chile, Colombia and Dominican Republic profiles.

05

SECTION

Comparative analysis of policy framework

Policy-design matrix, trade-offs and transferable design considerations, consolidated approaches, maturity tiers, context and key parameters across 32 countries

05 • COMPARATIVE ANALYSIS

Comparative analysis: policy framework matrix

No country uses one route alone. The labels name the lead instrument; most frameworks combine several, and some routes only work together: an incentive needs a legal definition, a standard needs laws that point to it, a zoning plan needs a permitting route. The matrix shows each country's lead instrument, what it is combined with, and what to add next.

Framework	Countries	Combined with	What this means for policymakers	Suggested policy priority
 Law	France, Czechia, South Korea, Austria	France: decree tests, control reports, financial guarantees. Czechia: crop list plus subsidy call. South Korea: zoning districts plus farmer eligibility. Austria: federal definition, state zoning plus grant exemption.	Agriphotovoltaics has a formal legal basis, making eligibility, land status and safeguards easier to enforce.	Add practical implementation rules, monitoring systems and farmer-facing guidance.
 Standard	Germany	Germany: EEG bonus, BauGB privilege, CAP rule and tax decrees all point to the standard.	An agricultural-use standard defines which installations count as agriphotovoltaic; laws, incentives and tax rules point to it.	Link standards with incentives, permitting and agricultural subsidy eligibility.
 Incentive	Italy, Greece	Italy: ground-mounted ban plus advanced-design criteria. Greece: farmer eligibility, caps and ten-year yield test.	Grants, tariffs or fixed-price contracts are being used to move agriphotovoltaics from concept to deployment.	Ensure incentives are conditional on agricultural continuity and farmer benefit.
 Scheme	India	India: solar-pump and feeder programme.	Agriphotovoltaics is being integrated into an existing rural-energy programme instead of a standalone law.	Define agriphotovoltaic design standards, land rules and crop-continuity checks within the scheme. Add a financing and farmer benefit-sharing package: remunerative FiT, capital support and FPO or cooperative ownership.
 Zoning	Netherlands, Israel	Netherlands: SDE++ subsidy. Israel: size tracks plus monitoring plots.	Spatial planning, land classes or eligible zones determine where agriphotovoltaics can be developed.	Clarify eligible land, protected areas, approval routes and project-size thresholds.
 Permit	Japan	Japan: feed-in tariff.	Agriphotovoltaics is allowed through temporary farmland-use permits, with continued cultivation required.	Use permit renewal and yield checks to prevent disguised land conversion.

Squares show the number of countries using each lead route.

05 • COMPARATIVE ANALYSIS

Policy framework matrix (continued)

Framework	Countries	Combined with	What this means for policymakers	Suggested policy priority
 Pilot	Vietnam, Tunisia, Mali, The Gambia, Chile, Colombia, Jamaica	As described on the profiles.	Countries are building local evidence before introducing full agriphotovoltaics regulation	Convert pilot results into technical standards, land-use rules and finance models.
 Roadmap	Thailand, Rwanda	As described on the profiles.	Governments or development partners are preparing structured pathways before deployment.	Move from roadmap to funded pilots, clear institutional roles and implementation timelines.
 Guidance	Australia	As described on the profiles.	Practical handbooks are guiding landholders and developers before formal regulation.	Translate voluntary guidance into minimum project-design and farmer-protection standards.
 Tender	South Africa	As described on the profiles.	Public procurement is being used to initiate agriphotovoltaics at agricultural infrastructure sites.	Build tender conditions around agricultural use, local benefit and long-term monitoring.
 Project	China, Egypt, Togo, Dominican Republic, Barbados	As described on the profiles.	Flagship projects are demonstrating agriphotovoltaics before comprehensive regulation exists.	Use project evidence to define eligibility, safeguards, monitoring and replication rules.
 Emerging	Spain, Morocco, Brazil, Cuba, Argentina	Spain: CAP eligibility rule (Oct 2025).	Policy interest exists, but dedicated agriphotovoltaics rules remain limited or under development.	Start with definitions, feasibility studies, pilot criteria and agriculture-first safeguards.

Why the routes differ

Countries with acute farmland scarcity and food-security politics (Japan, South Korea, Israel, France) regulate agricultural performance tightly; countries with established PV support schemes (Germany's EEG, Italy's PNRR) attached agriphotovoltaics to them; countries with ground-mounted bans (France, Italy) made agriphotovoltaics the exception; EU members had to fix CAP eligibility; countries that prioritised low administrative burden (Czechia) chose simple design rules over yield tests.

05 • COMPARATIVE ANALYSIS

Comparative analysis: a simpler view of the twelve routes

The twelve framework labels overlap, which can make it hard for a country to pick a starting model. They can be read as five approaches plus an emerging group. The table shows which labels each approach combines and the main variations within it. Most countries combine more than one approach.

1. Legal mandate LAW-LED, PERMIT-LED France, Czechia, South Korea, Austria, Japan Countries ready to legislate and enforce. Variation: a permanent statutory category (France, South Korea) or time-bound farmland permits that can be withdrawn (Japan).	2. Standards and guidance STANDARD-LED, GUIDANCE-LED Germany, Australia Countries with strong standards bodies or industry self-regulation. Variation: a standard that laws and incentives point to (Germany) or voluntary guidance for landholders (Australia).	3. Financial support INCENTIVE-LED, SCHEME-LED, TENDER-LED Italy, Greece, India, South Africa Countries with budget or an existing rural-energy programme. Variation: capital grant plus tariff (Italy), fixed-price support route with controlled third-party participation and agricultural-performance safeguards (Greece), a component of an existing scheme (India), public procurement on agricultural sites (South Africa).
4. Spatial planning ZONING-LED Netherlands, Israel (Austria also uses state zoning) Land-scarce or densely settled countries. Variation: a solar preference order that keeps PV off farmland (Netherlands) or a national plan with coverage, height and yield rules (Israel).	5. Evidence-building PILOT-LED, PROJECT-LED, ROADMAP-LED Vietnam, Thailand, China, Tunisia, Egypt, Rwanda, Togo, Mali, The Gambia, Chile, Colombia, Jamaica, Barbados, Dominican Republic Countries without local data on crops, water and yields. Variation: research pilots with control plots (Tunisia), a validated roadmap (Rwanda), commercial demonstrators (Togo) or project-led at scale ahead of rules (China).	Emerging EMERGING Spain, Morocco, Brazil, Argentina, Cuba Policy interest but no lead instrument yet. Spain is furthest ahead in this group, with a national CAP eligibility rule (October 2025).

Another way to slice the frameworks: which policy area leads the integration

Integration route	How agriphotovoltaics enters policy	Countries	What it implies
Energy-policy-led	Through energy law, tariffs, tenders or renewable-energy schemes, with agricultural safeguards attached	Germany (EEG), France (Energy Code), Italy (PNRR), Greece, Austria (EAG, EABG), India (PM-KUSUM), Tunisia (ANME), Brazil (distributed-generation law)	Scales faster and is easier to finance; agricultural safeguards must be added and enforced.
Agriculture-policy-led	Through farmland law, farm-payment (CAP) rules or agricultural programmes	Japan (Agricultural Land Act), South Korea (Farmland Act, MAFRA), Czechia (agricultural land fund law), Spain (CAP eligibility), Rwanda (MINAGRI), Morocco (Green Generation)	Protects farming by design; often lacks revenue support, so bankability needs separate attention.
Planning-led	Through national or regional land-use plans	Netherlands (solar preference order), Israel (national outline plan)	Controls where projects go; needs a parallel support and permitting route to deliver projects.

05 • COMPARATIVE ANALYSIS

Comparative analysis: policy maturity and the context behind it

Countries within a region are at different stages; Greece, for example, is not at the level of Germany or France. The tiers below apply the criteria from the summary: a binding definition, measurable agricultural safeguards, support or land status tied to that definition, and compliance checks during operation. Policy maturity is distinct from deployment.

<div>Advanced</div> <div>5 countries</div> <div><div></div><div></div><div></div></div>	<div>CRITERIA</div> <div>Binding definition in law, regulation or a standard referenced by law; quantified safeguards; support or land status tied to the definition; and an identifiable compliance route, whether at eligibility or during operation.</div> <div>France, Germany, Italy, Japan, Czechia</div>	<div>TYPICAL NEXT STEP</div> <div>Add operational monitoring where checks happen only at eligibility (Germany, Czechia); refine thresholds with monitoring data.</div>
<div>Developing</div> <div>7 countries</div> <div><div></div><div></div><div></div></div>	<div>CRITERIA</div> <div>Dedicated rules adopted recently or only in part; implementing rules, a definition or the first support round still pending</div> <div>South Korea, Israel, Austria, Greece, Netherlands, Spain, India</div>	<div>TYPICAL NEXT STEP</div> <div>Issue implementing rules and a definition; tie support to compliance; start monitoring.</div>
<div>Nascent</div> <div>20 countries</div> <div><div></div><div></div><div></div></div>	<div>CRITERIA</div> <div>No dedicated rules; evidence built through pilots, roadmaps, projects, tenders or voluntary guidance</div> <div>China, Australia, Vietnam, Thailand, Morocco, Egypt, Tunisia, Rwanda, Togo, Mali, The Gambia, South Africa, Brazil, Chile, Colombia, Argentina, Barbados, Cuba, Jamaica, Dominican Republic</div>	<div>TYPICAL NEXT STEP</div> <div>Set up data sharing and monitored pilots; draft a definition and agriculture-first safeguards. China is the exception: project-led at scale, but nascent in dedicated policy.</div>

Context behind the instruments: land, tenure and farming systems

The same instrument works differently on a 17-hectare registered family farm and on a one-hectare holding under customary tenure. The regional context below shapes which policy elements transfer.

Region	Landholding and tenure	Main farming systems in the profiles	Implication for policy design
Europe	Mostly family farms on titled land; EU average about 17 ha (2020). Parcels are registered for CAP payments (LPIS).	Arable crops, vineyards, orchards, hops, grassland and livestock	Eligibility can key off registered parcels and CAP rules; yield tests against reference data are feasible.
Asia-Pacific	Small, fragmented holdings in India (average 1.08 ha; 86% small and marginal), Japan and South Korea; large pastoral holdings in Australia	Rice, wheat and horticulture; sheep grazing in Australia	Collective ownership (FPOs, cooperatives) and farmer-only eligibility matter; permits must work for small parcels.
Africa	Mainly smallholder farming; much rural land held under customary tenure with limited formal title	Rain-fed staples, irrigated horticulture, desert reclamation farming (Egypt)	Community and cooperative ownership, secure land agreements, and off-grid uses such as irrigation and cold storage.
LAC	Large commercial estates alongside smallholder, Indigenous and community farms	Export fruit and horticulture (Chile), mixed smallholder farming (Colombia), island agriculture (Caribbean)	Inclusive design and benefit-sharing (Colombia) and clear concession terms (Dominican Republic).

Sources: Eurostat, Farms and farmland in the European Union (2020 agricultural census); Agriculture Census 2015-16, Ministry of Agriculture and Farmers Welfare; country profiles. Tiers and regional context are indicative.
Note: October 2025 CAP rule qualifies Spain as Developing despite the Emerging label

05 • COMPARATIVE ANALYSIS

Comparative analysis: design choices and their trade-offs

The 32 profiles show recurring design choices, not proven success factors: there is little evidence yet linking any framework design to agriphotovoltaic outcomes, and crops, farm structures and climates differ too much for universal rules. The table shows what each choice buys and what it costs.

Dimension	Strict end	Loose end	Gain / cost
Agricultural safeguards	France: yield at least 90% of a control zone. Israel: at least 85% cultivated, output at least 75% of regional standard.	Germany: 66% yield floor, checked at eligibility only. Czechia: no yield test, eligible-crop list.	Gain: farming protected, political acceptance. Cost: weather risk on revenue, harder financing, verification burden.
Financial incentives	Italy: 40% capital grant plus 20-year tariff, Greece: Fixed-price operating support outside competitive auctions, subject to European Commission approval; reference price to be determined separately	Germany: 0.5–1.2 ct/kWh tender bonus. United States: no agriphotovoltaics specific federal incentive.	Gain: fast deployment. Cost: budget; risk of alibi projects when criteria are weak. Bankability usually needs a combination of tariff, capital support and concessional credit, not one instrument.
Administrative complexity	France: control reports, financial guarantees, departmental land documents. Israel: four size tracks and detailed plans.	Czechia: crop list and two design ratios. Japan: three-year permits.	Gain: control and predictability. Cost: time, cost, exclusion of small farmers.
Monitoring during operation	France: control reports before and during operation. Israel: research plots. Japan: permit renewal tied to yields. Greece: ten-year proof of farming.	Germany and Czechia: eligibility checked once, no systematic operational check.	Gain: real dual use. Cost: bankability, administrative cost.
Ownership and land-use restrictions	South Korea: licensed operators limited to farmers, resident cooperatives and agricultural corporations (from December 2026). Greece: Registered professional farmers or qualifying third parties with landholder agreements; maximum two stations per eligible person	Germany, Italy: open to developers. United States: market-driven.	Gain: farmer benefit, no land capture. Cost: less capital, slower scale.

Recurring choices in frameworks that have produced deployment:

1

Define agriphotovoltaics before incentivising it

2

Keep agriculture as the protected asset

3

Clarify land status and approval routes

4

Target incentives to designs that meet the definition

5

Use pilots to build crop- and agro-climate-specific benchmarks and feed them back into standards

6

Build monitoring into permits and incentives from the outset

7

Coordinate the agriculture, energy and planning ministries from the start

05 • COMPARATIVE ANALYSIS

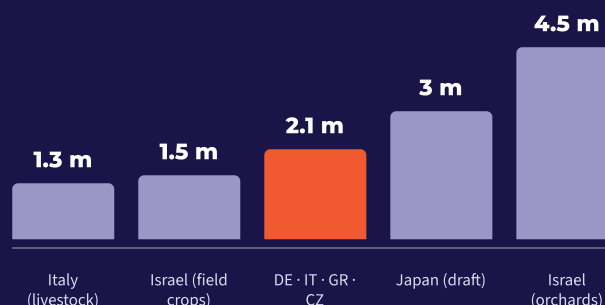
Comparative analysis: key quantitative parameters

Quantitative thresholds as stated in each country's policy instruments, set side by side for comparison. Countries not listed do not state quantified thresholds in the instruments reviewed.

Minimum yield retention stated in the instruments



Minimum clearance by system/crop type



Country	Crop yield retention or agricultural use	Land loss or coverage limit	Minimum panel height or spacing
France	Yield at least 90% of a control zone or regional reference	Non-cultivable area at most 10%; coverage at most 40% above 10 MWp (unless proven technology)	Not set nationally
Germany	At least 66% of reference yield (DIN SPEC 91434); livestock stocking at least 85% (DIN SPEC 91492)	Land loss at most 10% (category I) or 15% (category II)	Category I: clear height above 2.1 m (also the EEG bonus threshold)
Italy	At least 70% of system area farmed; certified preservation of at least 80% of gross saleable production (farmland carve-out)	Module-area ratio (LAOR) at most 40%	2.1 m for crops, 1.3 m for livestock (advanced systems)
Spain (Catalonia)	Yield at least 60% of reference	Land lost to structures at most 15% (elevated) or 20% (ground-level)	Not set
Austria	At least 75% of project area in agricultural production	Modules evenly distributed across the project area	Module lower edge at least 80 cm; rows at least 2 m apart (market-premium rules)
Greece	Yield at least 66% of pre-installation level, shown for ten years	Panels and associated equipment may cover at most 10% of the initially cultivated area	At least 2.1 m above ground, or on greenhouse roofs
Czechia	No yield test; eligible-crop list	At least 95% of area farmable (horizontal) or 80% (vertical)	Horizontal: 2.1 m; vertical: row spacing at least 3 times module height
Japan	Yield at least 80% of regional average (permit at risk below this)	Draft benchmark: shading below 30%	Draft benchmark: height about 3 m, pillar spacing 4–5 m
Israel	At least 85% of land cultivated; yield at least 75% of regional norm	Coverage at most 30%	1.5 m (field crops) to 4.5 m (orchards)

Reading the numbers: thresholds are not directly comparable. Reference yields differ (control plot, regional average or pre-installation level), and coverage is measured differently (France: ground projection of modules; Italy: module-area ratio). Future country profiles could report these parameters in a standard format wherever the policy states them.

05 • COMPARATIVE ANALYSIS

Comparative analysis: safeguards in operation

Continuing the safeguard comparison: how compliance is checked once projects run, how long land-use rights last, and who may own projects. Only rules stated in the instruments reviewed are shown.

Country	Monitoring and enforcement rule	Permit or land-use term	Ownership limits
France	Control reports before commissioning and during operation; financial guarantees for dismantling	Not set in the instruments reviewed	No ownership limit; farming must stay the main activity and secure a durable income for an active farmer
Germany	Eligibility checked once, at bidding or claiming; no systematic check in operation	No permit term	Open to developers; outer-area privilege only for farm-linked plants up to 2.5 ha, one per farm
Italy	Monitoring of water use, productivity and continuity (plus soil and microclimate for PNRR support)	20-year tariff under DM 436/2023	Open; 300 MW reserved through registers for farm projects up to 1 MW
Spain (Catalonia)	Five-year monitoring programme	Farming maintained for the project life	No limit
Greece	Ten-year proof that farming remains the main activity, backed by a EUR 100/kW guarantee	Ten-year monitoring period	Registered professional farmers or third-party natural or legal persons with an agreement with the land or greenhouse holder or manager; maximum two projects per eligible person.
Czechia	Eligibility checked at grant stage; no systematic operational check	Not set	Grants open to registered agricultural entrepreneurs
Japan	Permit renewal tied to yields; FIT/FIP payments suspended for violations	Temporary permits of up to three years (ten in some cases), renewable	Land stays agricultural; no owner limit
South Korea	Corrective orders, penalty surcharges and cancellation of business rights	Temporary farmland use up to 30 years (previously 8), from 17 December 2026	Licensed operators limited to qualifying local farmers, resident cooperatives and agricultural corporations
Israel	Ministry of Agriculture monitoring and control plots; research plot above 30 ha; permits revocable after two years of sub-standard farming	Not set in the instruments reviewed	No limit; fast track for a holding's first plot up to 1 ha

What went wrong: lessons from failures

Japan: about a quarter of solar-sharing sites (24% in FY2023) reported farming problems; FIT/FIP payments were suspended for 342 plants in 2024 and MAFF drafted national benchmarks. Permit renewal alone did not stop token farming.

Italy: PV "greenhouses" with little cultivation underneath were reported in parts of southern Italy, showing why eligibility needs a minimum cultivated share and not just a structure type.

China: WRI found many projects with high land-coverage ratios, weakening agricultural output where design rules were absent.

South Korea: concern about farmland speculation by outside developers shaped the 2026 Act, which, once in force, limits licensed operator status to farmers, resident cooperatives and agricultural corporations.

Common thread: safeguards checked only once, or not linked to payments, are the ones that failed.

06

SECTION

Model agriphotovoltaics policy framework

Core policy elements and suggested template for ISA Member Countries; India implementation roadmap; default parameters and sequencing by country type

06 • MODEL FRAMEWORK

Model framework: suggested template structure

A national or sub-national agriphotovoltaics policy can follow a ten-part template. The components mirror the profile dimensions and turn the comparative findings into a drafting checklist for ISA Member Countries.



● Foundations (1–3)

● Enabling rules (4–5)

● Support & safeguards (6–8)

● Delivery (9–10)

06 • MODEL FRAMEWORK

Model framework: default parameters

Indicative starting values for template parts 2 and 7, drawn from the ranges in the comparative tables. They are defaults to calibrate by crop, configuration and agro-climatic zone, not fixed recommendations.

Parameter	Range in the profiles	Indicative default for a first framework	Calibrate by
Crop yield retention	60% (Catalonia), 66% (Germany, Greece), 75% (Israel), 80% (Japan), 90% (France)	70–80% of a reference plot or regional average	Crop shade tolerance; climate (shade can raise yields in hot, dry zones)
Land loss and area farmed	Land loss 10–20%; area farmed 70–95% (Italy, Austria, Czechia, Israel)	Land loss at most 10–15%; at least 80% of the area farmed	Configuration (elevated, inter-row, vertical)
Coverage cap	30% (Israel) to 40% (France above 10 MWp; Italy LAOR)	At most 30–40%	Crop light needs; latitude
Minimum clearance	2.1 m for elevated crop systems (Germany, Italy, Greece, Czechia); 1.3 m for livestock (Italy); 1.5–4.5 m by crop (Israel); about 3 m (Japan draft)	2.1 m or more for elevated systems used with machinery; lower for livestock and inter-row systems	Machinery height; crop type
Monitoring	Once at eligibility (Germany, Czechia) to 5 years (Catalonia) and 10 years (Greece); continuous research plots (Israel)	Annual agronomic and energy reporting; independent verification at least every three years for the project life	Project size; administrative capacity
Permit or land-use term	3 to 10 years, renewable (Japan) to 30 years (South Korea)	Match the PPA or tariff term (typically 20–25 years), with periodic review	Bankability needs
Decommissioning guarantee	Financial guarantee required (France)	Guarantee sized to dismantling and land-restoration cost	Local cost data
Agricultural-performance security	EUR 100/kW (Greece), backing the ten-year obligation to keep farming the main activity	Optional security tied to the farming obligation, released on compliance	Monitoring regime; farmers' capacity to post security
Ownership	Farmer and qualifying third parties (Greece) Farmer, resident cooperative and agricultural corporations (South Korea), open to developers and investors (Germany, Italy)	Open, with a minimum farmer revenue share or a farmer and FPO ownership window	Landholding structure

Measurement protocol for yield tests

1 Reference

A control plot (France: at least 5% of the installation area, up to 1 ha) or, where none exists, a district or regional average yield.

2 Multi-year averaging

Compare yields over at least three seasons rather than a single year.

3 Crop rotation

Compare like crops, or rotation averages, rather than year-on-year results.

4 Force majeure

Exempt declared droughts, floods, pest outbreaks and other events outside the operator's control, so weather alone does not trigger penalties.

06 • MODEL FRAMEWORK

Model framework: other provisions and sequencing

Provisions the ten-part template should also cover, and a suggested order of steps depending on where a country starts.

Provision	What to include	Template part	Examples from the profiles
Tenant and landowner protection	Written leases that need the cultivating tenant's consent, a share of lease or power income for the tenant, and protection from eviction for the project term	8	South Korea (resident cooperatives); for India, the Model Agricultural Land Leasing Act 2016 as a state reference
Crop insurance and farm-subsidy retention	Keep agriphotovoltaic land eligible for farm payments, crop insurance and agricultural tax treatment	4	Germany (CAP eligibility, tax), Spain (CAP rule), Czechia (land stays in LPIS)
Grid and offtake design	Grid-connection priority, standard PPAs, net metering or off-grid options; produce offtake through FPOs and cold chains	9, 10	Italy (tariff), Greece (fixed price), The Gambia (off-grid), India (DISCOM PPAs)
Lead ministry	One named lead ministry and a coordination body: agriculture leads on definition and land status, energy on support and grid, planning on siting	3	Czechia (joint Environment and Agriculture decree); Israel (Planning Administration with Energy and Agriculture)
PV greenhouses, livestock and aquavoltaics	Separate categories with their own criteria; a minimum cultivated share under PV greenhouses	2	Germany (DIN SPEC 91492 livestock), Greece (greenhouse roofs), China (PV plus fisheries), Tunisia (excludes grazing projects)
Decommissioning	Financial guarantee, dismantling plan and land restoration at end of life	7	France

Suggested sequence by country type

COUNTRY TYPE	FIRST	THEN	FINALLY
Nascent: no dedicated rules, limited data	Data sharing across agencies; monitored pilots with control plots	A definition and crop-specific standard built on pilot results (pilot to standard)	Targeted incentives linked to the standard (standard to incentive)
Developing: rules adopted in part	Complete the definition and implementing rules	Align land status, farm payments and tax; tie incentives to compliance	Start monitoring in operation
Advanced	Add monitoring in operation where checks are one-off	Refine thresholds with monitoring data	Scale up or taper support

06 • MODEL FRAMEWORK

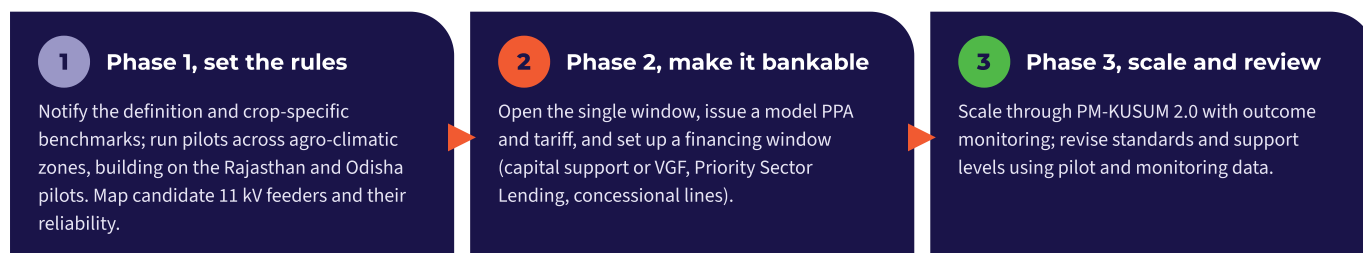
Model framework: India roadmap

Linking the template to institutional roles, financing, farmer-income outcomes and monitoring indicators under PM-KUSUM 2.0.

Institutional roles

Institution	Role	Template part	Indicator
MNRE	Notify the agriphotovoltaic definition, design categories and PM-KUSUM 2.0 component guidelines; set central financial assistance and capacity targets.	1, 2, 3, 6	GW sanctioned and commissioned against the 10 GW component
DISCOMs	Procure agriphotovoltaic power under transparent, standardised PPAs, including collective PPAs with FPOs; grid connection and timely payment; strengthen weak 11 kV feeders.	6, 8, 9	Procurement tariff against cost of supply; farm-power subsidy saved
State renewable-energy agencies	Single-window approval, land and feeder identification (incl. mapping 11 kV feeder reliability), project aggregation and tendering.	4, 5, 9	Days from application to approval; feeder uptime at agriphotovoltaic sites
State agriculture departments	Crop- and agro-climate-specific benchmarks; agricultural-continuity checks during operation.	2, 7	Yield against control plot or district average
Financial institutions	Priority Sector Lending, concessional and catalytic finance, and credit guarantees for farmers and FPOs.	6	Loans sanctioned; repayment performance
FPOs and cooperatives	Own or co-own plants, aggregate smallholders and distribute dividends.	8	Net farmer income per acre; share of revenue retained by farmers
Ministry of Finance (CBDT)	Clarify tax treatment of farmers' income from power sales and land lease (generally taxable, unlike agricultural income); consider a targeted exemption for small farmers and FPOs.	4, 8	Clarification issued; farmer income after tax
NISE, MSDE and State Rural Livelihood Missions	O&M training and certification building on Suryamitra, with targeted places for women farmers and SHG members, a growing share of the farm workforce as men migrate for work.	8	Technicians trained and certified; share of women

Suggested sequencing:



Outcome indicators

Farmer income uplift

Crop-yield retention

GW commissioned

DISCOM cost of farm power and subsidy saved

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