

AV SUMMER SCHOOL 2025 - Detailed Schedule						
DAY 1 "BUSINESS", July 7						
Lecturers	Stephan Schindele, BayWa Emilien Simonot, lightsource bp Emma Azeau, Statkraft David Schuppisser, Insolight	Targeted outcome Day 1: Understand how to develop an agrivoltaics project and main differences to GMPV				
TIME (CEST)						
8:30 - 9:00	Coffee & Check-in					
9:00 - 9:45	Conference Highlight I					
9:45 - 10:30	Conference Highlight II					
10:30 - 11:00	Coffee Break					
11:00 - 11:45	Conference Highlight III					
		Participants	Lead	Duration	Short description	
11:45 - 12:45	Roundtable: Market Trends	Emilien Simonot, Stephan Schindele, Oliver Hörnle, David Schuppisser	Emma Azeau	60 min	This roundtable reflects on the evolving AV market across scales and segments—from smallholder to utility-scale systems and challenges the benefits of agrivoltaics. Topics include regulatory frameworks and how they shape the market, capacity building, and some little-known benefits agrivoltaics can have.	
12:45- 13:45	Joint Lunch (Fraunhofer ISE canteen)					
13:45 - 14:45	Grassland	Emma Azeau, Emilien Simonot	Emma Azeau	60 min	This session will present the development of agrivoltaics on grasslands, with a focus on sheep grazing. The role of R&D for companies, illustrated by a French study on sheep welfare will also be explored..	
14:45 - 15:45	Arable farming	Stephan Schindele, Emilien Simonot	Stephan Schindele	60 min	This session explores business models for agrivoltaics in arable farming, focusing on the farmer's role. It covers contribution margin analysis and business case calculations for farmer-led investment in 1 MWp systems under German planning law.	
15:45- 16:00	Coffee Break					
16:00 - 17:00	Permanent Crops & Horticulture	David Schuppisser, Emilien Simonot	David Schuppisser	60 min	This session examines the business development opportunities for permanent crops and horticulture within agrivoltaic systems. We will discuss market trends, economic viability, and strategies for maximizing productivity and profit in sustainable farming practices.	
17:00-17:15	Wrap-up and Outlook					
18:30- 20:00	Joint Dinner					
DAY 2 "AGRICULTURE", July 8						
Lecturers	Greg Barron-Gaffort, Uni of Arizona Andreas Schweiger, Uni Hohenheim Lisa Pataczek, Uni Hohenheim	Targeted outcome Day 2: Understand the basics of plant growth in AV systems and gain first insights in field tests and crop modelling				
9:30 - 10:30	Plant physiology I	Andreas Schweiger	60 min	Introduction into plant ecology and ecophysiology		
10:30- 10:45	Coffee Break					
10:45 - 11:45	Plant physiology II	Greg Barron-Gaffort	60 min	This session provides a foundational understanding of plant physiology and the environmental pressures that limit plant function. We will explore factors that restrict plant performance, how agrivoltaics can mitigate these pressures, and identify gaps in our global understanding of these interactions.		
11:45- 12:00	Coffee Break					
12:00 - 13:00	Insights in Agricultural Practices	Lisa Pataczek	60 min	Introduction into practical aspects of farming activities		
13:00- 13:30	Joint Lunch (Fraunhofer ISE canteen)					
	Group work					
	Practical Exercises of Field Tests, AV Bot at Fh ISE Campus	Group 1 Group 2 Group 3 Group 4 Group 5 Group 6 Group 7 Group 8	All lecturers	2:40 h	Practical group work on light response, stomatal conductance, chlorophy content, and leaf temperature.	
13:30- 16:10	Equipment for practical excercises 1. Group LI-COR (UHO) 2. Porometer devices 3. Thermal cameras for heat flux					
16:20- 16:30	Coffee Break					
16:30 - 18:00	Data evaluation and role of crop models	Andreas Schweiger, Greg Barron-Gaffort, Lisa Pataczek	90 min	Overview of data life cycles and analysis of data on light response, diurnal patterns, water relations and the role of crop models.		
18:00 - 18:15	Wrap-up					
DAY 3 "PV Technology", July 9						
Lecturers	Matthew Berwind, Fraunhofer ISE Maddelena Bruno, Fraunhofer ISE	Targeted outcome Day 3: Understand the basics of plant growth in AV systems and gain first insights in field tests and crop modelling				
10:00 - 11:30	Foundation of PV Cells	Matthew Berwind	45 min	An introduction to PV cell technology, covering key principles, cell types, efficiency trends, and technological innovations.		
	Foundation of PV Modules	Matthew Berwind	45 min	This session covers the basics of PV modules, including structure, materials, performance factors, and degradation—building essential knowledge for further work with PV systems.		
11:30 - 11:45	Coffee Break					
11:45 - 12:30	PV System Components	Matthew Berwind	45 min	Overview of key PV system components beyond the PV module: inverters, mounting structures, cabling, and grid connection—laying the groundwork for understanding complete PV installations.		
12:30 - 13:15	Agrivoltaics PV Technologies	Matthew Berwind	45 min	Introduction to agrivoltaic PV technologies, including system types like elevated, tracker-based, and semi-transparent setups highlighting key differences to ground-mounted PV.		
13:15 - 14:15	Joint Lunch (Fraunhofer ISE canteen)					
14:15 - 15:15	Modelling	Matthew Berwind	60 min	Introduction to electrical yield modelling in agrivoltaics, including key parameters like bifacial gains, tracking systems, shading effects, and their impact on system performance prediction.		
15:15 - 16:15	Tracking	Maddalena Bruno	60 min	Explores tracking strategies in agrivoltaics, including algorithms that optimize PV orientation while considering crop needs—balancing light availability, water use, and energy yield		
16:15 - 16:30	Coffee Break					
16:30 - 17:30	Field Insights in R&D Projects	Matthew Berwind	60 min	Field insights from Fraunhofer ISE's AV research projects, with emphasis on PV system design, performance monitoring, tracking behavior, and interactions between technology and the agricultural environment.		
17:30 - 19:30	City Tour Freiburg					
DAY 4 "ENVIRONMENT", July 10						
Lecturers	Pietro Campana, Mälardalen University Erion Bousi, BayWa Matthew Sturchio, Cornell University Raphela Ari Kießler, Fraunhofer ISE Jana Kalmbach, Fraunhofer ISE	Targeted outcome Day 4: Gain an integrated understanding of environmental interactions in AV systems through insights into microclimate modelling and monitoring, biodiversity, soil health, water use, and life cycle assessment.				
9:30 - 10:30	Microclimate Introduction	Pietro Campana	60 min	This session introduces the concept of microclimates within agrivoltaic systems, emphasizing their positive and negative impacts on both agricultural productivity and electricity generation, as well as the associated challenges in modelling these complex interactions		
10:30 - 11:15	Microclimate Monitoring	Pietro Campana, Matthew Sturchio	45 min	This session presents the key differences between monitoring practices in PV systems, conventional agricultural, and agrivoltaic systems, with a particular emphasis on microclimate monitoring. The session will also showcase examples of microclimate monitoring systems implemented in both research settings and commercial agrivoltaic facilities.		
11:15 - 11:30	Coffee Break					
11:30 - 12:30	Microclimate Modelling & Validation	Pietro Campana	60 min	This session provides an overview of the current state of research on microclimate modelling in agrivoltaic systems and presents numerical examples illustrating the effects of shading on microclimate conditions		
12:30- 13:15	Biodiversity & Ecological Considerations	Matthew Sturchio	45 min	PV systems represent a unique opportunity to restore agricultural ecosystems while mitigating the effects of future climate stressors. In this lecture, we will highlight opportunities for enhancing the stability and resiliency of croplands and grasslands by leveraging unique environmental heterogeneity within PV arrays		
13:15 - 14:15	Joint Lunch (Fraunhofer ISE canteen)					
14:15 - 15:15	Water	Erion Bousi	60 min	This session covers the interaction between agrivoltaics and rainwater harvesting, focusing on design principles, operational efficiency, and cost analysis to optimize resource management in sustainable agriculture.		
15:15 - 15:30	Coffee Break					
15:30 - 16:15	Soil	Jana Kalmbach	45 min	This session will cover an introduction about soil and the risk for soil compaction during construction processes. Required vehicles and traffic during agrivoltaic installation, soil assessment methods, legal aspects, and mitigation measures will be discussed.		
16:15 - 17:15	Life Cycle Assesment	Raphela Ari Kießler	45 min	Introduction to the current state of LCA research on agrivoltaics, including exemplary results, common challenges or recommended research objectives		
	Wrap-up					
DAY 5 "Socio-Economics", July 11						
Lecturers	Alexis Pascaris, NREL Sebastian Gölz, Fraunhofer ISE Max Trommsdorff, Fraunhofer ISE	Targeted outcome Day 5: Improve awarenes of the importance of the social aspects. Increased understanding of: different stakeholder perceptions on agrivoltaics, enabling and constraining factors of legal frameworks, key partnerships and collaboration needs, and what methods can be used to explore social aspects				
9:30 - 10:00	Introduction to Social Sciences and the Non-technical Aspects of Agrivoltaics	Alexis Pascaris	30 min	This session will provide an introduction to social science theories and methods in energy research. Issues related to energy siting and acceptance will be explored. The session will conclude with a primer on the social science of agrivoltaics.		
10:00 - 11:00	Deep Dive: Social Aspects of Agrivoltaics	Sebastian Gölz	60 min	Thorough discussion on key research findings related to acceptance, multistakeholder perceptions, conflicts, adoption motivations across stakeholders, concerns, political feasibility, equity and justice, etc.		
11:00 - 11:15	Coffee Break					
11:15- 12:15	Implications of Social Aspects on Agrivoltaics Project Development	Sebastian Gölz and Alexis Pascaris	60 min	Implications of Social, Economic, and Political Aspects on Agrivoltaics Deployment: This session will highlight case studies that demonstrate how community acceptance, economics, and policy have affected agrivoltaic stakeholders and projects.		
12:15 - 13:15	Roundtable: Legal Aspects	Alexis Pascaris, Max Trommsdorff, Sebastian Gölz	60 min	This roundtable discussion will explore the importance of legal frameworks in agrivoltaics deployment. Panelists will discuss issues of standards, definitions, and cross-sector alignment and their implications on the global development landscape.		
13:15 - 14:15	Joint Lunch (Fraunhofer ISE canteen)					
14:15 - 15:00	Basics of Economics	Max Trommsdorff	45 min	This session covers key economic indicators in AV, including revenue splits and the price-performance ratio as a tool to assess viability—followed by a discussion on investment decisions under budget vs. land constraints.		
15:00 - 15:45	Partnerships, Collaboration, and Agreements	Alexis Pascaris	45 min	This session provides an overview of the suggested foundational activities to undertake and key elements to consider before building an agrivoltaic system to increase overall impact, success, and longevity. Key issues related to coordination in R&D and business models / agreements will be covered.		
15:45 - 16:00	Coffee Break					
16:00 - 17:30	Role Playing Exercise: Negotiation and Collaboration in Agrivoltaics Project Development	All lecturers and participants	90 min	Participatory exercise that lets students put theory into practice. Small groups will work through negotiation, values management, and consensus related to adoption scenarios involving key stakeholders.		
17:30 - 17:45	Wrap-up Farewell Dinner					