List of projects

Joint project: PV2050: Novel PV technologies for optimum space usage and efficient electricity production

Project leader: Christophe Ballif

Umbrella project	**Prof. Christophe Ballif** Institut de Microtechnique EPFL - STI - IMT CH-2000 Neuchâtel	PV2050: Novel PV technologies for optimum space usage and efficient electricity production
Subproject 1	**Prof. Christophe Ballif** Institut de Microtechnique EPFL - STI - IMT CH-2000 Neuchâtel	PV2050: Building blocks for next generation multi-junction solar cells
Subproject 2	**Prof. Bettina Furrer** Institut für Nachhaltige Entwicklung Zürcher Hochschule Winterthur CH-8401 Winterthur	PV2050: Sustainability, market deployment and interaction to the grid – the impacts of advanced photovoltaic solutions
Subproject 3	**Prof. Michael Grätzel** Laboratoire de photonique et interfaces EPFL - SB - ISIC – LPI CH-1015 Lausanne	PV2050: Novel generation perovskite devices
Subproject 4	**Prof. Frank Nüesch** Departement Moderne Materialien, ihre Oberfläche und Grenzflächen EMPA CH-8600 Dübendorf	PV2050: Novel materials and interfaces for advanced photovoltaic devices
Subproject 5	**Dr. Laure-Emmanuelle Perret-Aebi** Centre Suisse d'Electronique et de Microtechnique SA CH-2002 Neuchâtel 2	PV2050: Photovoltaics into the built environment: from semi-transparent PV glazing to high efficiency roof integrated solutions

Subproject 6	**Dr. Matthias Schmid** ICP - Institute for Computational Physics ZHAW CH-8401 Winterthur	PV2050: Simulation and characterization: from cells to systems

Joint project: Supply of electricity for 2050: hydropower and geo-energies

Project leader: Domenico Giardini

Umbrella project	**Prof. Domenico Giardini** Institut für Geophysik ETH Zürich CH-8092 Zürich	Supply of electricity for 2050: hydropower and geo-energies
Subproject 1	**Prof. Robert Michael Boes** Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie (VAW) ETH Zürich CH-8092 Zürich	Potential for future hydropower plants in Switzerland: a systematic analysis in the periglacial environment (PHP)
Subproject 2	**Prof. Robert Michael Boes** Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie (VAW) ETH Zürich CH-8092 Zürich	Adequate sediment handling at high-head hydropower plants to increase scheme efficiency
Subproject 3	**Prof. Paolo Burlando** Institut für Umweltingenieurwissenschaften ETH Zürich CH-8093 Zürich	Optimizing Environmental Flow Releases under Future Hydropower Operation (HydroEnv)
Subproject 4	**Prof. Larryn W. Diamond** Institut für Geologie Universität Bern CH-3012 Bern	Exploration and characterization of deep underground reservoirs

Subproject 5	**Dr. Thomas Driesner** Institut für Geochemie und Petrologie ETH Zürich CH-8092 Zürich	Modelling permeability and stimulation for deep heat mining
Subproject 6	**Prof. Stefan Wiemer** Schweizerischer Erdbebendienst ETH Zürich CH-8092 Zürich	Risk Governance of Deep Geothermal and Hydro Energy
Subproject 7	**Dr. Massimiliano Zappa** Eidg. Forschungsanstalt für Wald, Schnee und Landschaft WSL CH-8903 Birmensdorf ZH Kaserne	HEPS4Power - Extended-range Hydrometeorological Ensemble Predictions for Improved Hydropower Operations and Revenues

Joint project: The Future of Swiss Hydropower: An Integrated Economic Assessment of Chances, Threats and Solutions

Project leader: Hannes Weigt

Umbrella project	**Prof. Hannes Weigt** Wirtschaftswissenschaftliche Fakultät Universität Basel CH-4002 Basel	The Future of Swiss Hydropower: An Integrated Economic Assessment of Chances, Threats and Solutions
Subproject 1	**Prof. Werner Hediger** Zentum für wirtschaftspolitische Forschung HTW Chur CH-7000 Chur	Regional Impact Analysis and Sustainability Assessment of Hydropower
Subproject 2	**Dr. Franco Romerio-Giudici** Economie et politique de l'énergie Institut des sciences de l'environnement Université de Genève CH-1227 Carouge GE	Hydropower investments in the perspective of a new energy paradigm (HP Investment)

Subproject 3	**Prof. René Schumann** Institut Informatique de gestion HES-SO Valais CH-3960 Sierre	Hydro Power Operation and Economic Performance in a Changing Market Environment

Joint project: Concrete Solutions

Project leader: Guillaume Habert

Umbrella project	**Prof. Guillaume Habert** Institut für Bau- und Infrastrukturmanagement CH-8093 Zürich	Concrete Solutions
Subproject 1	**Prof. Eleni Chatzi** Institut für Baustatik und Konstruktion ETH Zürich CH-8093 Zürich	Getting more out of Structures through Monitoring and Simulation
Subproject 2	**Dr. Emmanuel Denarié** Laboratoire de maintenance, construction et sécurité des ouvrages EPFL - ENAC - IIC - MCS CH-1015 Lausanne	Next generation UHPFRC for a sustainable built environment
Subproject 3	**Prof. Robert J. Flatt** Institut für Baustoffe (IfB) ETH Zürich CH-8093 Zürich	Formulation, use and durability of concrete with low clinker cements
Subproject 4	**Prof. Andrea Frangi** Institut für Baustatik und Konstruktion ETH Zürich CH-8093 Zürich	Beech wood concrete hybrid structures

Subproject 5	**Prof. Pietro Lura** Abteilung Analytische Chemie EMPA CH-8600 Dübendorf	Low-clinker, high-performance concrete elements pre-stressed with carbon-fiber reinforced polymer reinforcement (LCHPC)

Joint project: Reduction & reuse of CO_2: renewable fuels for efficient electricity production

Project leader: Andre Heel

Umbrella project	**Prof. Thomas Hocker** Zürcher Hochschule für Angewandte Wissenschaften CH-8400 Winterthur	Reduction & reuse of CO_2: renewable fuels for efficient electricity production
Subproject 1	**Dr. Andreas Borgschulte** Departement Mobilität, Energie und Umwelt EMPA CH-8600 Dübendorf	Catalytic methanation of industrially-derived CO_2
Subproject 2	**Vicente Carabias** Institut für Nachhaltige Entwicklung Zürcher Hochschule Winterthur CH-8401 Winterthur	Sustainability assessment of the CO_2 methanation value chain: environmental impacts and socio-economic drivers and barriers
Subproject 3	**Prof. Anders Hagfeldt** Laboratoire de photonique et interfaces EPFL - SB - ISIC - LPI CH-1015 Lausanne	Renewable Hydrogen Production through Photoelectrochemical (PEC) Water Splitting
Subproject 4	**Dr. Andre Heel** Laboratory for Ceramic Materials Institute for Materials and Process Engineer ZHAW CH-8401 Winterthur	Smart materials concept for SOFC anodes: Self-regenerating catalysts for efficient energy production from renewable fuels

Subproject 5	**Prof. Jürgen Schumacher** Institute of Computational Physics ICP Zürcher Hochschule für Angewandte Wissenschaften ZHAW CH-8401 Winterthur	Designing multifunctional materials for proton exchange membrane fuel cells

Joint project: Sustainable waste and resource management to support the energy turnaround (wastEturn)

Project leader: Konrad Hungerbühler

Umbrella project	**Prof. Konrad Hungerbühler** Institut für Chemie- und Bioingenieurwissenschaften ETH Zürich CH-8093 Zürich	Sustainable waste and resource management to support the energy turnaround (wastEturn)
Subproject 1	**Prof. Stefanie Hellweg** Institut für Umweltingenieurwissenschaften ETH Zürich	Optimising the energy recovery and the sustainability of Swiss municipal solid waste management
Subproject 2	**Prof. Christoph Hugi** Institut für Ecopreneurship Hochschule für Life Sciences Fachhochschule Nordwestschweiz CH-4132 Muttenz	Economic Assessment of Industrial and Municipal Waste Treatment Options and Waste-to-Energy (WtE) Systems
Subproject 3	**Prof. Konrad Hungerbühler** Institut für Chemie- und Bioingenieurwissenschaften ETH Zürich CH-8093 Zürich	Optimisation of industrial waste-to-energy (WtE) and resource recovery systems

Subproject 4	**Dr. Michael Stauffacher** Institute for Environmental Decisions Natural and Social Science Interface ETH Zürich CH-8092 Zürich	Initiating Transitions of Swiss Municipal Solid Waste Management (InTraWaste)

Joint project: Integration of Intermittent Widespread Energy Sources in Distribution Networks

Project leader: Jean-Yves Le Boudec

Umbrella project	**Prof. Jean-Yves Le Boudec** Laboratoire pour les communications informatiques et leurs applications EPFL - IC - LCA2 CH-1015 Lausanne	Integration of Intermittent Widespread Energy Sources in Distribution Networks
Subproject 1	**Dr. Colin Jones** Laboratoire d'automatique 3 EPFL - STI - IGM - LA3 CH-1015 Lausanne	Integration of Intermittent Widespread Energy Sources in Distribution Networks: Storage and Demand Response
Subproject 2	**Prof. Jean-Yves Le Boudec** Laboratoire pour les communications informatiques et leurs applications EPFL - IC - LCA2 CH-1015 Lausanne	Integration of Intermittent Widespread Energy Sources in Distribution Networks: Scalable and Reliable Real Time Control of Power Flows

Joint project: Integration of sustainable multi-energy-hub systems at neighbourhood scale (IMES)

Project leader: Marco Mazzotti

Umbrella project	**Prof. Marco Mazzotti** Institut für Verfahrenstechnik ETH Zürich CH-8092 Zürich	Integration of sustainable multi-energy-hub systems at neighbourhood scale (IMES)
Subproject 1	**Dr. Turhan Hilmi Demiray** Forschungsstelle Energienetze ETH Zürich CH-8092 Zürich	Integration of sustainable multi-energy-hub systems from the system control perspective (IMES-SC)
Subproject 2	**Prof. Volker Hoffmann** Departement Management, Technologie und Ökonomie D-MTEC ETH Zürich CH-8092 Zürich	Economic assessment of multi-energy-hub systems integration at neighbourhood scale (IMES-ECO)
Subproject 3	**Prof. Marco Mazzotti** Institut für Verfahrenstechnik ETH Zürich CH-8092 Zürich	Technical evaluation of multi-energy-hub systems integration at neighbourhood scale (IMES-TEC)
Subproject 4	**Dr. Kristina Orehounig** Professur Bauphysik Institut für Technologie in der Architektur ETH Zürich CH-8093 Zürich	Integration of sustainable Multi-Energy-hub Systems from the Building Performance perspective (IMES-BP)
Subproject 5	**Dr. Roman Seidl** Institut für Umweltentscheidungen ETH Zürich CH-8092 Zürich	Integration of sustainable multi-energy-hub systems from a societal perspective (IMES-SE)

Joint project: THRIVE: Thermally driven adsorption heat pumps for substitution of electricity and fossil fuels

Project leader: Bruno Michel

Umbrella project	**Dr. Bruno Michel** IBM Research GmbH CH-8803 Rüschlikon	THRIVE: Thermally driven adsorption heat pumps for substitution of electricity and fossil fuels
Subproject 1	**Dr. Matthias Koebel** Abteilung Bautechnologien Departement Bau- und Maschineningenieurwesen EMPA CH-8600 Dübendorf	THRIVE: Tailored materials for high-performance adsorption heat pumps
Subproject 2	**Prof. André R. Studart** Departement Materialwissenschaft ETH Zürich CH-8093 Zürich	THRIVE: Materials assembly for high transport rates in adsorber heat exchangers
Subproject 3	**Prof. Matthias Rommel** Institut für Solartechnik SPF Hochschule für Technik Rapperswil CH-8640 Rapperswil SG	THRIVE: Development of an adsorption heat pump - Component characterization and integration in compact device
Subproject 4	**Stéphane Citherlet** Laboratoire d'énergétique solaire et de physique du bâtiment LESBAT HEIG-VD CH-1401 Yverdon	THRIVE: Thermally driven adsorption heat pumps for substitution of electricity and fossil fuels: tests, simulation and validation of applications
Subproject 5	**Dr. Peter Burgherr** Laboratory for Energy Systems Analysis Paul Scherrer Institut (PSI) CH-5232 Villigen PSI	THRIVE: Sustainability analysis of thermally driven heat conversion in Switzerland

Joint project: Wood combustion for energy in buildings

Project leader: Thomas Nussbaumer

Umbrella project	**Prof. Thomas Nussbaumer** Hochschule Technik+Architektur Luzern CH-6048 Horw	Wood combustion for energy in buildings
Subproject 1	**Dr. Josef Dommen** Labor für Atmosphärenchemie Paul Scherrer Institut CH-5232 Villigen PSI	Toxicity and impact of aerosol formation from wood combustion on ambient air
Subproject 2	**Prof. Thomas Nussbaumer** Hochschule Technik+Architektur Luzern CH-6048 Horw	Wood combustion for energy in buildings Part 1: Technologies to minimise pollutant formation

Joint project: ACTIVE INTERFACES - Holistic operational strategies crossing over obstacles for large-scale advanced PV integration into urban renewal processes

Project leader: Emmanuel Rey

Umbrella project	**Prof. Emmanuel Rey** Laboratoire d'architecture et technologies durables EPFL ENAC IA LAST CH-1015 Lausanne	ACTIVE INTERFACES - Holistic operational strategies crossing over obstacles for large-scale advanced PV integration into urban renewal processes
Subproject 1	**Prof. Jean-Philippe Bacher** iEnergy Ecole d'ingénieurs et d'architectes EIA-FR CH-1705 Fribourg	ACTIVE INTERFACES - Holistic strategy to accelerate the transposition of advanced BIPV adapted solutions into real innovative practices

Subproject 2	**Prof. Christophe Ballif** Institut de Microtechnique EPFL - STI - IMT CH-2000 Neuchâtel	ACTIVE INTERFACES - Holistic strategy for PV adapted solutions embracing the key technological issues
Subproject 3	**Prof. Emmanuel Rey** Laboratoire d'architecture et technologies durables EPFL ENAC IA LAST CH-1015 Lausanne	ACTIVE INTERFACES - Holistic strategy for BIPV adapted solutions in urban renewal design processes
Subproject 4	**Prof. Stephen Wittkopf** Hochschule Technik+Architektur Luzern CH-6048 Horw	ACTIVE INTERFACES - Holistic strategy to simplify standards, assessments and certifications for building integrated photovoltaics
Subproject 5	**Prof. Rolf Wüstenhagen** Institut für Wirtschaft und Ökologie Universität St.Gallen CH-9000 St. Gallen	ACTIVE INTERFACES – Understanding consumer and investor preferences to overcome barriers for a large use of BIPV in the Swiss urban context

Joint project: Assessing Future Electricity Markets (AFEM)

Project leader: Christian Schaffner

Umbrella project	**Dr. Christian Schaffner** Energy Science Center (ESC) ETH Zürich CH-8092 Zürich	Assessing Future Electricity Markets (AFEM)
Subproject 1	**Dr. Turhan Hilmi Demiray** Forschungsstelle Energienetze ETH Zürich CH-8092 Zürich	Infrastructure for Future Electricity Markets (AFEM-INFRA)

Subproject 2	**Prof. Sebastian Rausch** Centre for Energy Policy Economics (CEPE) ETH Zürich CH-8032 Zürich	FUTURE - Future Electricity Market Models
Subproject 3	**Prof. Hannes Weigt** Wirtschaftswissenschaftliche Fakultät Universität Basel CH-4002 Basel	Combining Electricity Models (AFEM-MODEL)

Joint project: „SwiSS Transformer" – Solid State SiC Transformer

Project leader: Nicola Schulz

Umbrella project	**Prof. Nicola Schulz** Institut für Aerosol- und Sensortechnik Hochschule für Technik Fachhochschule Nordwestschweiz CH-5210 Windisch	„SwiSS Transformer" – Solid State SiC Transformer
Subproject 1	**Prof. Jens Gobrecht** Labor für Mikro- und Nanotechnologie Paul Scherrer Institut CH-5232 Villigen PSI	3.3kV SiC MOSFET and diodes for advanced power electronic systems
Subproject 2	**Prof. Johann W. Kolar** Departement für Hochspannungstechnologie ETH Zurich CH-8092 Zürich	SwiSS Transformer - P3: 99% Efficient Solid State SiC Transformer Cell Demonstrator
Subproject 3	**Prof. Nicola Schulz** Institut für Aerosol- und Sensortechnik Hochschule für Technik Fachhochschule Nordwestschweiz CH-5210 Windisch	Application and sustainability of SiC SSTs in the Swiss electrical grid

Subproject 4	**Prof. John R. Thome** Laboratoire de transfert de chaleur et de masse EPFL - STI - IGM - LTCM CH-1015 Lausanne	Integrated 3D Cooling SiC Power Module Packaging

Joint project: High-Temperature Combined Sensible/Latent-Heat Storage Based on Novel Materials for Electricity Storage Using Advanced Adiabatic Compressed Air Energy Storage

Project leader: Aldo Steinfeld

Umbrella project	**Prof. Aldo Steinfeld** Institut für Energietechnik ETH Zürich CH-8092 Zürich	High-Temperature Combined Sensible/Latent-Heat Storage Based on Novel Materials for Electricity Storage Using Advanced Adiabatic Compressed Air Energy Storage
Subproject 1	**Dr. Maurizio Barbato** Dipartimento Tecnologie Innovative (DTI) Scuola universitaria professionale della Svizzera italiana (SUPSI) CH-6928 Manno	Analysis of AA-CAES cycles exploiting Combined Sensible/Latent Thermal Energy Storage and Novel Materials
Subproject 2	**Dr. Andreas Haselbacher** Departement für Maschinenbau und Verfahrenstechnik ETH Zentrum CH-8092 Zürich	Design and Optimization of High-Temperature Combined Sensible/Latent-Heat Storage
Subproject 3	**Prof. Sophia Eva Martha Haussener** Laboratoire de la science et de l'ingénierie de l'énergie renouvelable EPFL - STI - IGM - LRESE CH-1015 Lausanne	Aluminium-silicon based phase change material structures for high-temperature latent heat storage

Joint project: Production of fuels and commodity chemicals through subsequent biochemical and catalytic conversion of lignocellulosic biomass

Project leader: Michael Hans-Peter Studer

Umbrella project	**Dr. Michael Hans-Peter Studer** Hochschule für Agrar-, Forst- und Lebensmittelwissenschaften HAFL Berner Fachhochschule BFH CH-3052 Zollikofen	Production of fuels and commodity chemicals through subsequent biochemical and catalytic conversion of lignocellulosic biomass
Subproject 1	**Dr. Jan Hendrik Grenz** Lecturer Hochschule für Agrar-, Forst- und Lebensmittelwissenschaften HAFL Berner Fachhochschule BFH CH-3052 Zollikofen	Sustainability evaluation of biorefinery systems for fuel and commodity chemical generation from plant residues
Subproject 2	**Jeremy Luterbacher** Lab. des procédés durables et catalytiques Institut des sciences et ingénierie chimique EPFL SB ISIC LPDC CH-1015 Lausanne	Catalytic upgrading of biomass-derived carboxylic acids for fuel and chemical production
Subproject 3	**Dr. Michael Hans-Peter Studer** Hochschule für Agrar-, Forst- und Lebensmittelwissenschaften HAFL Berner Fachhochschule BFH CH-3052 Zollikofen	Consolidated bioprocessing of lignocellulosic biomass for production of lactic acid and mixed carboxylic acids as fuel precursor

Individual projects

Prof. Majed Chergui Laboratoire de spectroscopie ultrarapide EPFL - SB - ISIC - LSU CH-1015 Lausanne	Preparation and characterization of high efficiency hybrid organic-inorganic thin film solar cells
Prof. Christian M. Franck Departement für Hochspannungstechnologie D-ITET ETH Zurich CH-8092 Zürich	Hybrid HVAC / HVDC overhead lines in Switzerland
Prof. Markus Friedl Institut für Energietechnik Hochschule für Technik Rapperswil HSR CH-8640 Rapperswil SG	Renewable Methane for Transport and Mobility (RMTM)
Prof. Katharina M. Fromm Département de Chimie Université de Fribourg CH-1700 Fribourg	New rechargeable metal-water and metal-air batteries: fundamental science & feasibility
Prof. Anthony Patt Institute for Environmental Decisions Natural and Social Science Interface ETH Zürich CH-8092 Zürich	New Risks: trade-offs in switching from nuclear electricity to renewables in Switzerland

Prof. Anton Schleiss Laboratoire de constructions hydrauliques EPFL - ENAC - IIC - LCH CH-1015 Lausanne	Hydro-Ecology and Floodplain Sustainability in Application (HyApp)

Prof. Ullrich Steiner Adolphe Merkle Institute Université de Fribourg CH-1723 Marly 1	Hierarchically structured materials for super-capacitors and batteries

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