



D-MAVT CARES

New sustainable Focus Projects

D MAVT

Compensation

Acquisition of offset certificates for residual emissions.

Awareness

Information about pros and cons of alternative travelling options.

Reduction

Significant reduction of CO₂ emissions due to air travel.

Education on

Competitive funding for a mix of bottom-up student projects.

Sustainability

Student projects tackle the Sustainable Development Goals.

Funded via D-MAVT Internal Carbon Price (per ton CO₂ emitted due to air travel): 20%C / 80%E.

Sustainable development

- Sustainable Development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, Our common future, Brundtland Report, 1987).
- Sustainable Development is a normative framework embracing (J. D. Sachs, The age of sustainable development, 2015):
 - economic development;
 - social inclusion;
 - environmental sustainability;
 - good (public/private) governance.

D-MAVT CARES calls for Focus Projects proposals addressing SDGs (HS2019 – FS2020)



<https://www.un.org/sustainabledevelopment/>

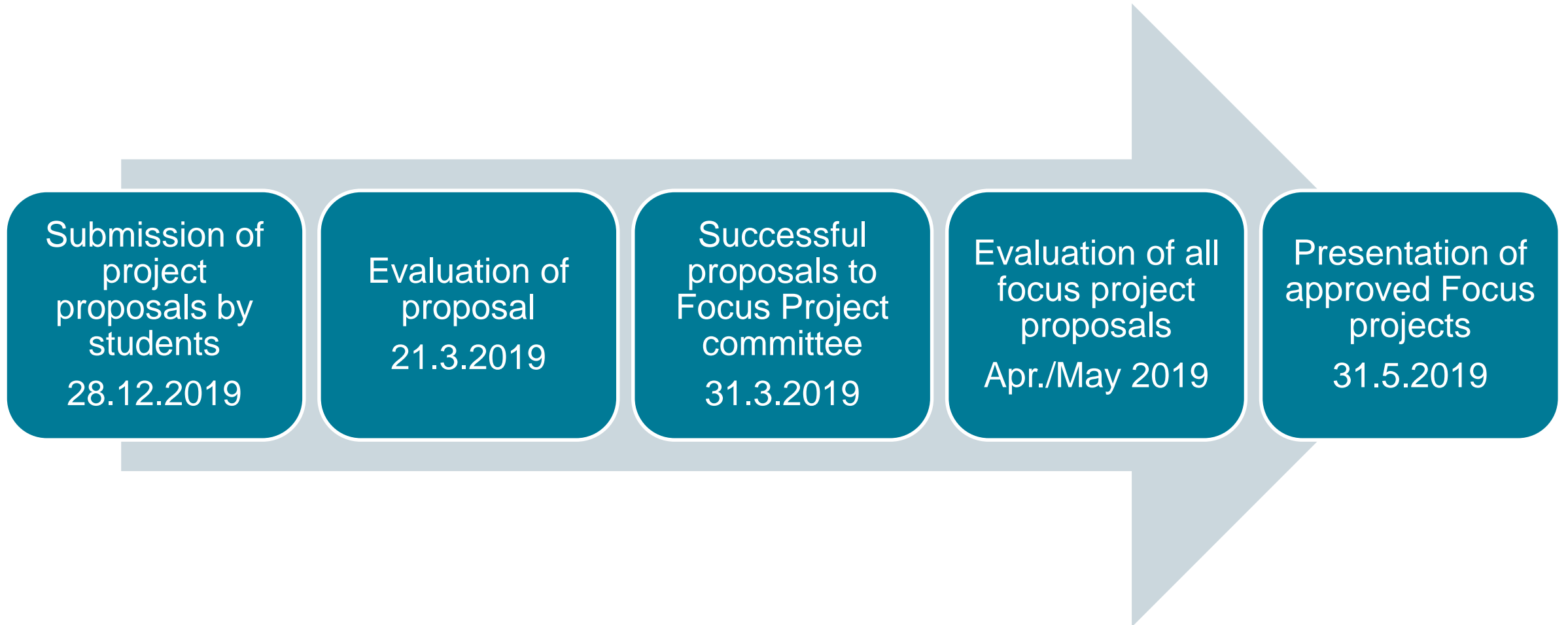
D-MAVT CARES calls for Focus Projects proposals addressing SDGs (HS2019 – FS2020)

- Project proposals (up to 2 pages, including budget, by 28.2.2019) developed by students independently (at the time of proposal submission the team does not need to be fully formed yet).
- Proposals evaluated by a specific MAVT evaluation committee.
- Scientific and educational quality according to ETH/MAVT criteria.
- Fulfilment of Focus Projects criteria (<https://www.mavt.ethz.ch/studies/bachelor.html>).
- Addressing scientific and engineering challenges for one or more of the seventeen Sustainable Development Goals.
- Sensible budget.
- Feasible research plan.
- Identification of potential supervisor(s).

Focus Projects

- Teams of 3 to 8 students work during 5th and 6th semester on solving a specific problem by realizing a product/solution, thus obtaining their BS degree (classes are selected *ad hoc*).
- Based on a specific need, all processes in product development are conducted in a realistic manner: marketing, conception, design, engineering, simulation, prototypes, and production.
- Proposed by students within D-MAVT CARES, instead of by professors, with the aim of addressing one or more of the seventeen UN Sustainable Development Goals (2015).

Process



2030 Agenda for Sustainable Development

- [The 2030 Agenda for Sustainable Development](#), adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future.
- At its heart are the 17 Sustainable Development Goals (together with 169 specific targets, associated to 232 indicators) which are an urgent call for action by all countries - developed and developing - in a global partnership.
- They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests.
- Today, the [Division for Sustainable Development Goals](#) in the United Nations [Department of Economic and Social Affairs](#) provides substantive support and capacity-building for the SDGs and their related thematic issues, including [water](#), [energy](#), [climate](#), [oceans](#), [urbanization](#), [transport](#), [science and technology](#).
- The Sustainable Development Goals build on decades of work by countries and the UN.

2030 Agenda for Sustainable Development

- 1992, [Earth Summit](#) in Rio de Janeiro, adoption of [Agenda 21](#), a plan of action to build a global partnership for sustainable development.
- 2000, [Millennium Summit](#) in New York, elaboration of eight [Millennium Development Goals](#) to reduce extreme poverty by 2015.
- 2002, [World Summit on Sustainable Development](#) in Johannesburg, Declaration on Sustainable Development and the Plan of Implementation.
- 2012, [UN Conf. on Sustainable Development \(Rio+20\)](#) in Rio de Janeiro, adoption of the document "[The Future We Want](#)" and launch of a process to develop the SDGs.
- 2013, UN General Assembly set up a 30-member [Open Working Group](#) to develop a proposal on the SDGs.
- 2015, UN General Assembly began the negotiation process on the [post-2015 development agenda](#).
- 2015: a landmark year for multilateralism and international policy shaping:
 - [Sendai Framework for Disaster Risk Reduction](#), March.
 - [Addis Ababa Action Agenda on Financing for Development](#), July.
 - [Transforming our world: the 2030 Agenda for Sustainable Development](#) with its 17 SDGs was adopted at the [UN Sustainable Development Summit](#) in New York, September.
 - [Paris Agreement on Climate Change](#), December.
- Now, the Annual [High-level Political Forum on Sustainable Development](#) serves as the central UN platform for the follow-up and review of the SDGs.

SDG 7, for example



- Ensure access to affordable, reliable, sustainable and modern energy for all.
- Facts and figures:
 - one in five people still lacks access to modern electricity;
 - 3 billion people rely on wood, coal, charcoal or animal waste for cooking and heating;
 - energy is the dominant contributor to climate change, accounting for around 60 per cent of total global greenhouse gas emissions;
 - reducing the carbon intensity of energy is a key objective in long-term climate goals.
- Targets (all by 2030):
 - ensure universal access to affordable, reliable and modern energy services;
 - increase substantially the share of renewable energy in the global energy mix;
 - double the global rate of improvement in energy efficiency;
 - enhance international cooperation to facilitate access to clean energy research and technology & promote investment in energy infrastructure and clean energy technology;
 - expand infrastructure & upgrade technology to supply energy for all in developing countries.

Sustainable Development Goals

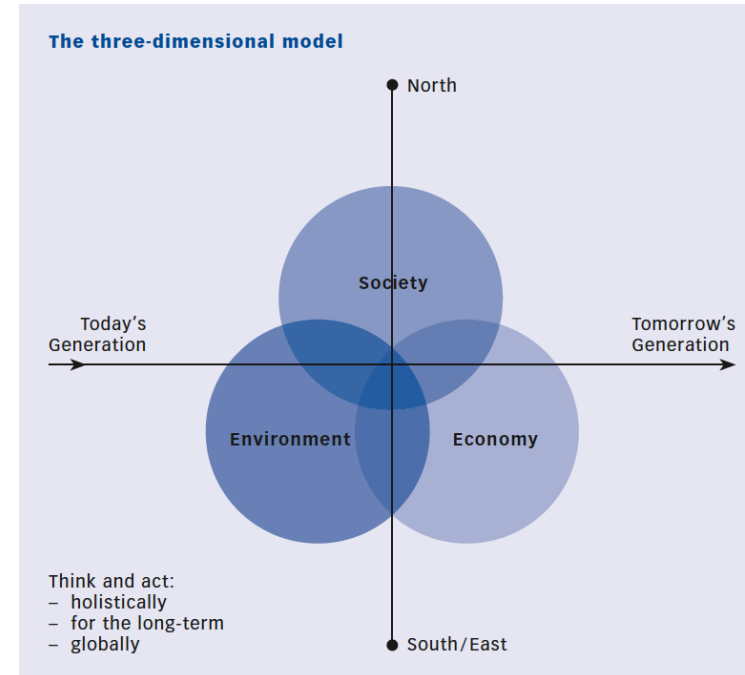
1. **No poverty**: End poverty in all its forms everywhere
2. **Zero hunger**: End hunger, achieve food security and improved nutrition and promote sustainable agriculture
3. **Good health and well-being**: Ensure healthy lives and promote well-being for all at all ages
4. **Quality education**: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
5. **Gender equality**: Achieve gender equality and empower all women and girls
6. **Clean water and sanitation**: Ensure availability and sustainable management of water and sanitation for all
7. **Affordable and clean energy**: Ensure access to affordable, reliable, sustainable and modern energy for all
8. **Decent work and economic growth**: Promote sustained, inclusive and sustainable economic growth, full and productive employment, decent work for all
9. **Industry, innovation and infrastructure**: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Sustainable Development Goals

10. **Reduced inequalities**: Reduce inequality within and among countries
11. **Sustainable cities and communities**: Make cities and human settlements inclusive, safe, resilient and sustainable
12. **Responsible consumption and production**: Ensure sustainable consumption and production patterns
13. **Climate action**: Take urgent action to combat climate change and its impacts
14. **Life below water**: Conserve and sustainably use the oceans, seas and marine resources for sustainable development
15. **Life on land**: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
16. **Peace and justice strong institutions**: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
17. **Partnership for the goals**: Strengthen the means of implementation and revitalize the global partnership for sustainable development

Swiss Sustainable Development Strategy – Action Plan 2016-19

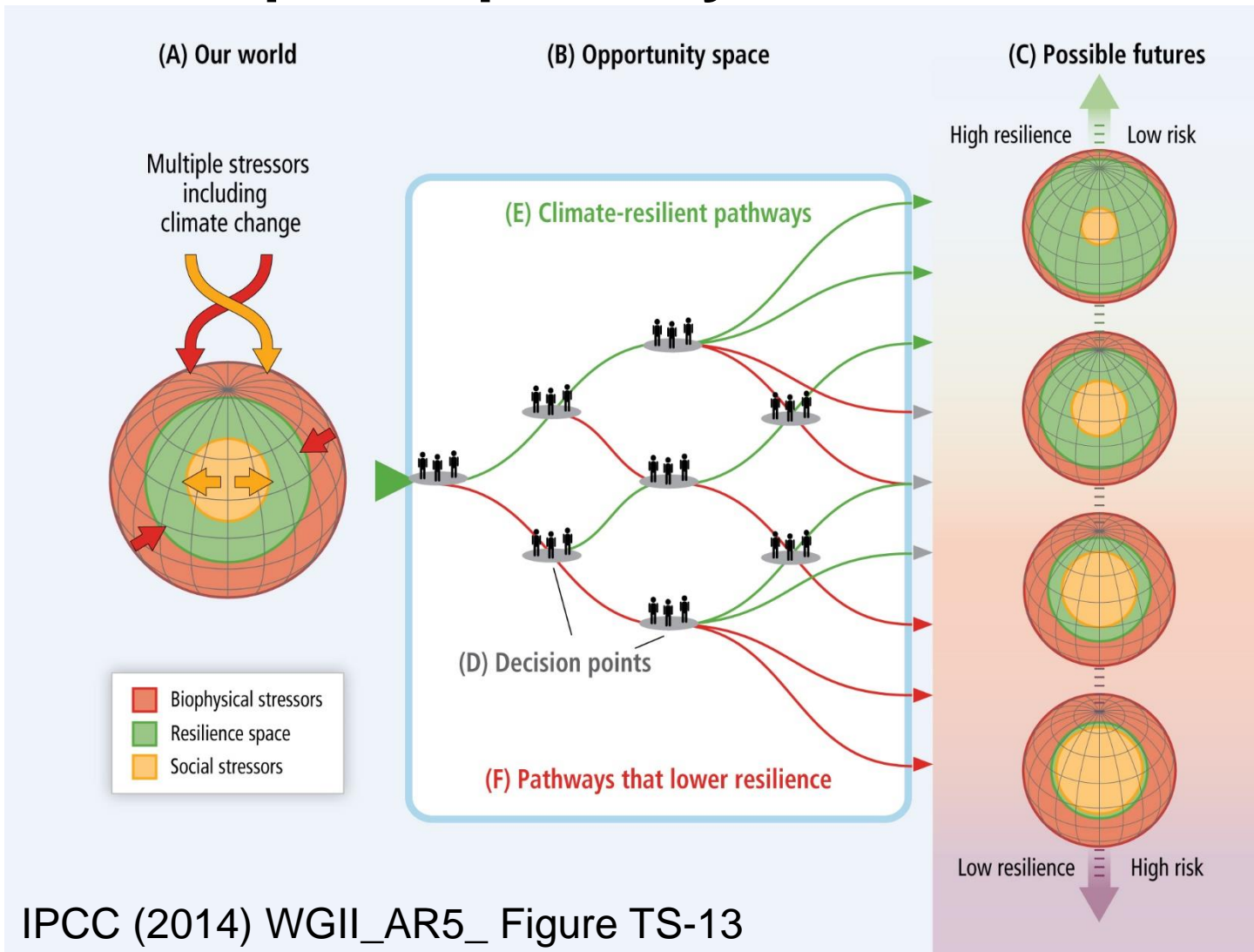
- Consumption and production
- Urban development, mobility and infrastructure
- Energy and climate
- Natural resources
- Economic and financial system
- Education, research and innovation
- Social security
- Social cohesion and gender equality
- Health



1. Universality, hence differentiation
2. Integration, hence indivisibility
3. Transformation and structural change

<https://www.eda.admin.ch/agenda2030/en/home/agenda-2030/die-17-ziele-fuer-eine-nachhaltige-entwicklung.html>

Development pathways



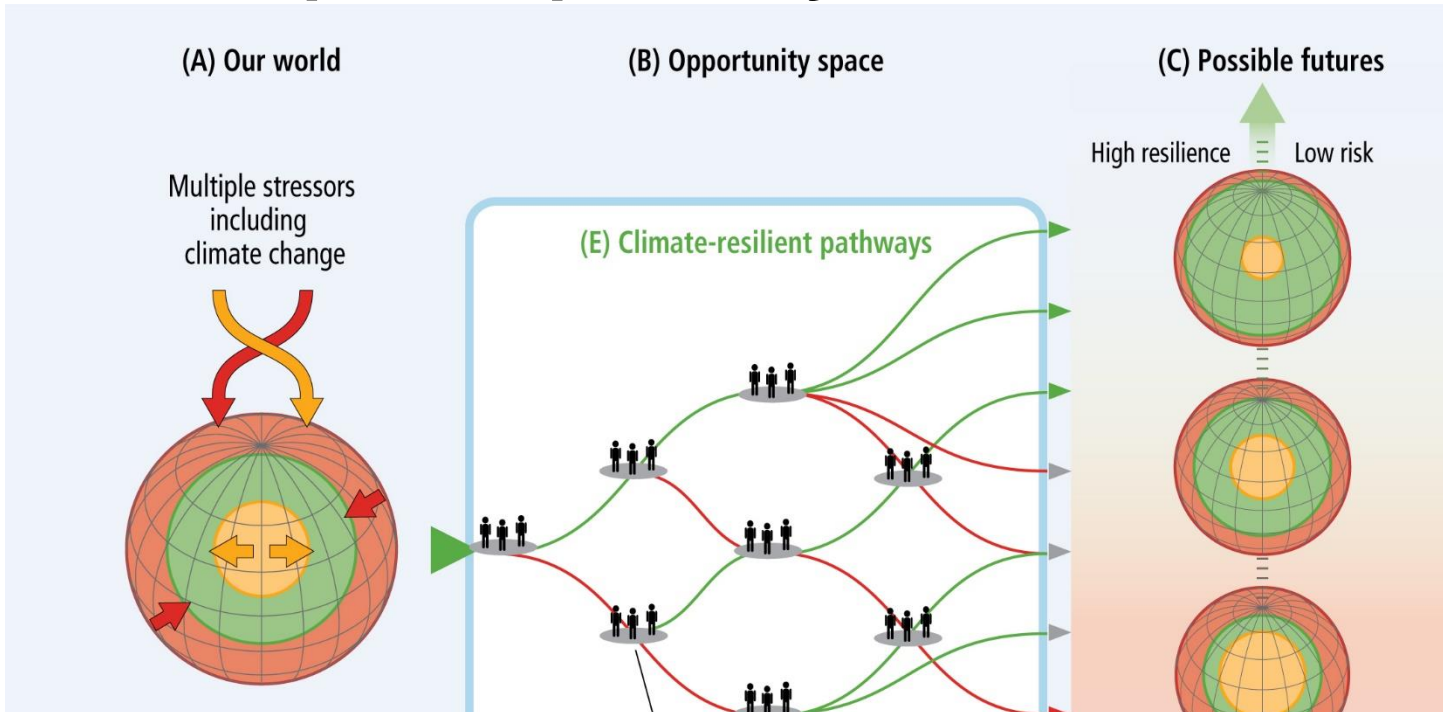
IPCC (2014) WGII_AR5_ Figure TS-13

D MAVT

Departement für Maschinenbau und Verfahrenstechnik
Department of Mechanical and Process Engineering

- Horizon of decision makers:
 - policymakers: 2 y
 - private sector: 6 m to 40 y
 - SDGs: till 2030
 - IPCC scenarios: till 2100
- Impact of decisions:
 - regulations: years
 - infrastructure: decades
 - climate: centuries
- Who should make the decisions then?

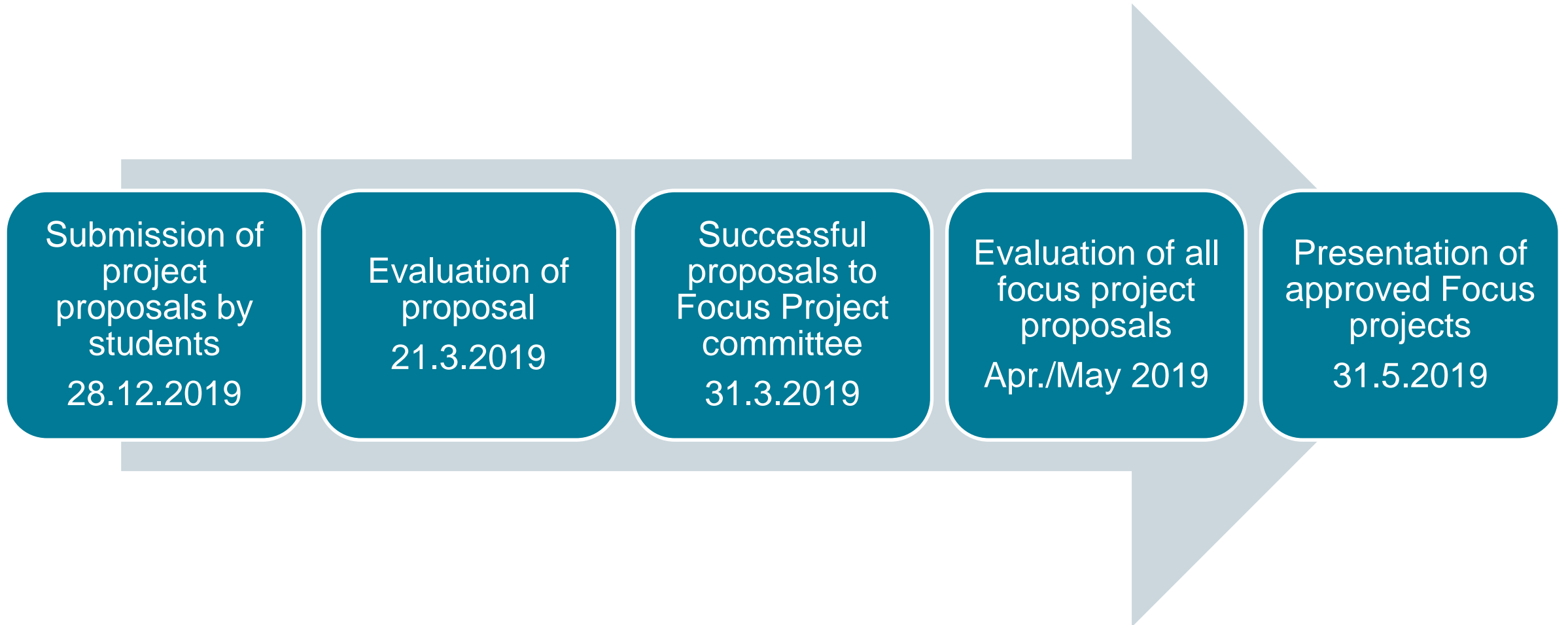
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 - regulations: years

Sustainable Development is both feasible and affordable... The essence of Sustainable Development in practice is *scientifically and morally based problem solving* (J.D. Sachs, *The age of sustainable development, 2015*).

D-MAVT CARES – Process



D-MAVT CARES – Project Proposal (2-pages)

- Team description
 - Current team and ideal size
- Budget
 - Need help: AV MAVT
- List of potential supervisor(s)
- Deadline: 28.2.2019
- Brief project description
 - Motivation
 - Objectives
 - Vision of the final product
- Rough project plan
 - 4-5 sub goals
- Which Sustainable Development Goals are addressed and how

Useful links

- Carbon Storage Showcase: a Fokus Projekt, 2011-12
<http://www.spl.ethz.ch/scientificeducationaltools/showcase.html>
- Slides and documents on D-MAVT CARES
<http://www.spl.ethz.ch/> (News and Events)
 - Slides of this presentation on D-MAVT CARES
 - Package with additional information on SDGs from the official UN website
 - Swiss Sustainable Development Strategy 2016-19
- PhD students to contact:
 - Luca Bosetti: bosettil@ethz.ch
 - Max Held: held@lav.mavt.ethz.ch