Spotlight on
Switzerland

orgalim
EUROPE'S TECHNOLOGY INDUSTRIES

TECHNOLOGY AT HEART

Energy efficiency and new energy systems

TECHNOLOGY IN ACTION

We feature case studies from three Swiss technology companies pioneering new energy systems and share their insights into the enablers and the obstacles along the way.

TECHNOLOGY MEETS POLICY

In conversation with Swissmem's CEO, we examine the qualities that make the Swiss high-tech manufacturing ecosystem so effective, and how policy can help.

MAN Energy Solutions

Synhelion

SWISSMEM

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#TechAtHeart

Orgalim is committed to championing an EU policy agenda for sustainable growth, to supporting the industry in its transformation, and to advancing dialogue between business, policymakers and citizens on the relationship of technology to society.

FOREWORD

The energy crisis has focused policy minds firmly on the urgent need to accelerate the energy transition in Europe. All the attention now is on how to do it right.

As the International Energy Agency emphasised at the close of 2022, to avoid gas shortages in the EU in 2023, policy actions need to focus on accelerating the electrification of heat, enabling more rapid deployment of renewables, and incentivising faster improvements in energy efficiency.[1]

The good news is the technologies to do all these things already exist and European companies are leaders in many of them, as the case studies in this report show. Focusing on Swiss technology companies, one tells how the Danish port city of Esbjerg is weaning itself off coal-fired power by implementing an innovative, large-scale heat pump system to supply electrified district heating to 100,000 inhabitants.

> **Policy actions need to focus on accelerating the electrification of heat, enabling more rapid deployment of renewables, and incentivising faster improvements in energy efficiency.**

Another involves pioneering technology to harness energy directly from the sun and produce synthetic aviation fuel, without any burden on the electricity grid. The third demonstrates the potential to drive energy efficiency in the transport sector, the second biggest contributor to greenhouse gas emissions in the EU.

Between them, they highlight both the importance of sector coupling to increase the linkages between different parts of the energy system, and of technology neutrality, so as not to limit those linkages.

> **This report aims to contribute valuable insights to support efforts to accelerate the transition to a renewable, resilient and efficient European energy system.**

By shining a light on these leading-edge cases and the Swiss high-tech manufacturing ecosystem from which they emerged, this report aims to contribute valuable insights to support efforts to accelerate the transition to a renewable, resilient and efficient European energy system. It is produced in collaboration with Swissmem, the Swiss technology industries association, a member of Orgalim, and I am pleased to share it with you.

Malte Lohan,
Director General, Orgalim

Malte Lohan

Malte Lohan is the Director General of Orgalim, Europe's Technology Industries, speaking for innovative companies spanning the mechanical engineering, electrical engineering, electronics and ICT, and metal technology branches. He is responsible for setting Orgalim's strategy, acting as the senior representative of the European technology industries in Brussels and managing the operations of the association.

[1] How to avoid gas shortages in the European Union in 2023

Introduction

Think of Switzerland and what comes to mind? Mountains, lakes, chocolate, watches, cheese fondue, the Swiss Army knife and Roger Federer? As cliché will have it, the country has long held a reputation as a stable, prosperous and slightly staid culture, respectable, responsible and as reliable as its precision timepieces.

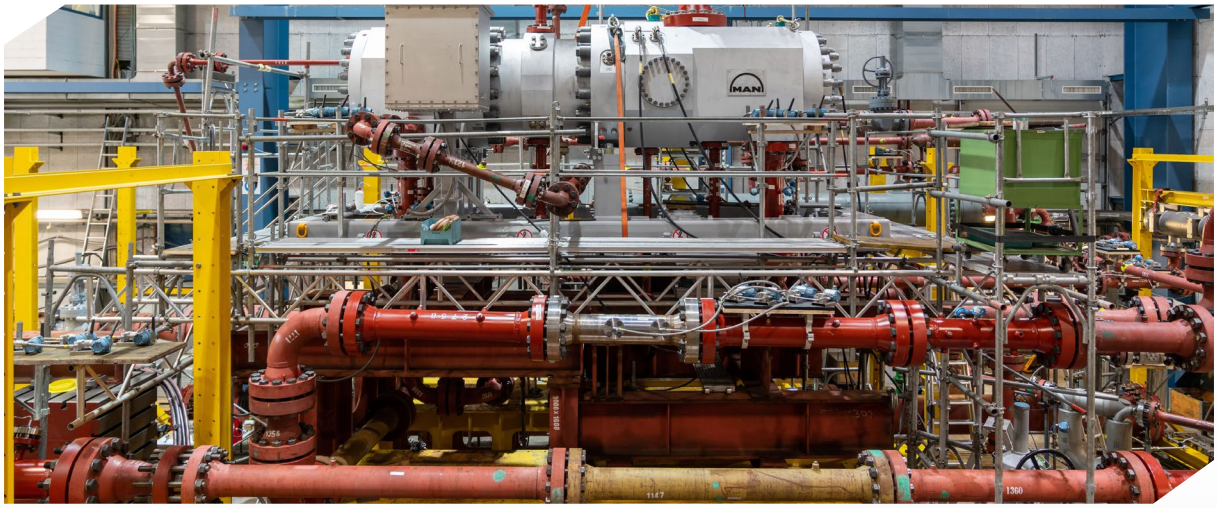
But think again, because this Alpine nation of less than nine million people is these days dubbed 'the Silicon Valley of Robotics' and consistently ranks the most innovative country in the world. With four official languages across a land area smaller than the Netherlands, it is the diverse home to some of the top technical universities globally, in ETHZ and EPFL in Zurich and Lausanne, and came top of the Global Talent Competitiveness Index in 2022. Indeed Zurich is ranked the third most competitive city for talent in the world, behind San Francisco and Boston.

Supported by an innovation ecosystem linking these top educational and research institutions with industry, Swiss industry's traditional strengths in mechanical and precision engineering have found new outlets in cutting edge innovation, not just in robotics, but in a broad array of advanced manufacturing technologies, products and services, pioneered by both large multinationals and many small and medium-sized enterprises. It is no surprise that between them they account for over a quarter of Swiss exports to the EU, its largest trading partner.

Renewable energy systems and energy efficiency – especially in buildings, machinery and transport – are a particular focus, especially as the country moves to phase out nuclear power, which has accounted for around a third of domestic energy production. Many Swiss companies are breaking new ground in technologies to produce or transform renewable energy, in decarbonising energy production, in energy storage and management systems, energy efficiency, transport technologies and more.

In the case studies that follow, we shine a light on three of them, drawing out insights into how they are making the energy transition happen in practice, and what the implications are for policymaking at the national and European levels.

Decarbonising district heating and cooling



Challenge

One of the key challenges of the energy transition is the decarbonisation of the heating and cooling sectors. Buildings are currently the single largest energy consumer in Europe: their heating and cooling accounts for half of the EU's energy consumption, and still relies mainly on fossil fuels.[2]

District heating already supplies about 10% of residential and service sector heating needs in the EU and is increasingly recognised as part of the solution, "a potential backbone for coherent local energy transition strategies," as a European Commission study said.

But district heating (and cooling) systems still run mostly on fossil fuels, mainly natural gas and coal. One of the most critical technologies for decarbonising them – heat pumps – has yet to be widely scaled up for district heating systems.

This is the challenge that the industrial port city of Esbjerg took up a few years ago. Esbjerg has been the primary base for all Danish oil and gas activity in the North Sea for decades and its main power plant is coal-fired, emitting some 100,000 tonnes of CO_2 per year. Its ambition now is to be carbon neutral by 2030. How is it getting there?

Solution

The Esbjerg utility, DIN Forsyning is working with MAN Energy Solutions Switzerland to implement an innovative, large-scale heat pump system which will use sea water and renewable energy from wind farms to provide around 235 gigawatt hours of climate-neutral district heating to 100,000 inhabitants.

> **Using renewable energy sources directly breaks through the dependency on fossil fuels for heating and cooling and contributes to grid balancing.**

Patrik Meli, Senior VP, Managing Director of MAN Energy Solutions Switzerland Ltd

[2] District heating and cooling in the European Union

Visualisation of the new district heating plant in Esbjerg © Arkitema

"Using renewable energy sources directly breaks through the dependency on fossil fuels for heating and cooling and contributes to grid balancing," emphasises Patrik Meli, Senior Vice President, Managing Director of MAN Energy Solutions Switzerland Ltd. "This sector coupling is key."

Heat pumps are increasingly recognised as indispensable for cutting emissions and natural gas use in Europe; the challenge is scaling them up to the higher temperatures required to provide district heat.[3] MAN's ETES (electrothermal energy-storage) heat pump system being installed in Esbjerg is innovative in using carbon dioxide as a refrigerant, at higher pressures, enabling the higher temperatures needed. Industrial heat pumps with different refrigerants only work at notably lower temperatures and pressures.

The other advantage of using carbon dioxide is that it is non-toxic and non-flammable. This was of particular interest to the utility company in case of any leakage, as Denmark's Wadden Sea is a UNESCO world cultural heritage site.

In its full configuration, the ETES system is also able to store any excess renewable electricity generated as thermal energy (in the form of hot water and ice in insulated reservoirs), so that the system can accommodate peaks and troughs of renewable energy generation. The highly flexible system can also feed power into the grid when demand is high to help with grid balancing. This, as Mr Meli points out, is particularly valuable in a country like Denmark that has a high percentage of renewables in its energy mix.

Policy implications

Most important, says Mr Meli, is to be as open as possible regarding the technologies for decarbonisation, and not think in silos, focusing all efforts on one solution, like say hydrogen. We need to combine and collaborate on many different technology solutions to enable the sector coupling that is essential to our future energy systems, he argues. Esbjerg port has plans for the development of ammonia and fertiliser production, and data centres, all potential sources of waste heat for district heating, for example.

Secondly, while there are no regulations that stand in the way of heat pumps, the same cannot be said for energy storage, he points out. Specifically, Long Duration Energy Storage (LDES). The EU has set new targets for LDES, leaving it to the private market and investors to achieve these goals, but the tendency is to back the better-known solutions, namely batteries, hydro or, lately, hydrogen. Again, with new technologies emerging rapidly, it is important to ensure development is not limited to a few solutions. More support is needed to help scale-up other technologies from prototype to commercialisation.

Related Orgalim position papers

- Renewable Energy Directive
- Energy Taxation Directive
- Energy Efficiency Directive
- Energy Performance of Building Directive

About MAN Energy Solutions

MAN Energy Solutions

MAN Energy Solutions Switzerland develops and makes high-tech compressions systems for a wide range of industrial sectors and applications, and has developed the MAN ETES Heat Pump Unit system being installed in Esbjerg. Based in Zurich, the company counts 800 employees and is part of Germany-based MAN Energy Solutions, which employs some 14,000 people at over 120 sites globally. MAN Energy Solutions' stated purpose is to engineer systems for deep decarbonisation in the sectors that matter most. The company has committed to reduce CO_2 emissions in its own production by 50%, to offer a CO_2 neutral version for each main application in new build, and to ensure that its solutions for decarbonising marine, energy and industry make up at least half of total revenue – all by 2030.

man-es.com

[3] The Future of Heat Pumps

Using solar heat to produce sustainable fuel

Challenge

The decarbonisation of the transport sector, which is responsible for 27% of total greenhouse gas emissions in the EU, needs to accelerate. Aviation is not the biggest contributor (road transport is) but it is a rapidly growing one, and particularly difficult to decarbonise, especially long-haul flights.

Flights of over 1,500 kms account for around 80% of aviation CO_2 emissions and electrification of this long-haul aviation is currently not an option because the batteries needed would be too heavy.[4] Hydrogen technology is a promising alternative, but it requires designing aircraft differently.

The strategy that holds the most promise for reducing emissions in the short to medium term is scaling up the use of sustainable aviation fuels, or SAF. SAF is a drop-in technology that is compatible with conventional jet engines and infrastructure for storage and refuelling.

The challenge is to rapidly improve the availability and affordability of SAF to increase its uptake. Currently SAF costs more than double conventional jet kerosene and its use is estimated at less than 0.1% of EU jet fuel consumption. The EU regulation on ensuring a level playing field for sustainable air transport aims to mandate at least 2% SAF in aviation fuel by 2025 and 5% by 2030, gradually increasing to 63% in 2050.[5]

Solution

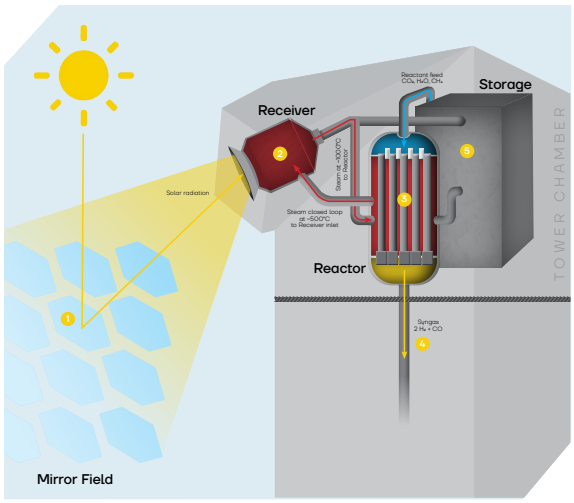
Swiss clean energy company Synhelion has successfully scaled up a unique solar thermal process to produce sustainable fuel using only solar heat as an energy source. It is now building its first industrial plant in Germany which will be commissioned in 2023. The first commercial plant is planned for 2025 in Spain.

As Philipp Furler, CEO and Co-Founder of Synhelion, explains: "We have based our technology on solar heat because the sun is the most abundant, most distributed, and cheapest renewable energy source. Thanks to our thermal energy storage, we can produce fuels around the

> **Our solar fuel plants don't compete with agricultural demand for arable land and work independently from the electrical grid.**

Philipp Furler, CEO & Co-Founder, Synhelion

[4] ATAG facts & figures
[5] EU regulation on ensuring a level playing field for sustainable air transport



Synhelion's solar fuel technology: how it works

clock. Our solar fuel plants don't compete with agricultural demand for arable land and work independently from the electrical grid."

The company aims to produce 875 million litres of fuel per year using this Sun-to-X process within the next ten years – equivalent to half of Switzerland's annual aviation fuel needs – and to produce enough to cover half of the European jet fuel demand by 2040. It is targeting a production cost below €1 per litre by 2030, competitive with other sustainable fuel technologies and ultimately with fossil fuel pricing.

How does it work? Essentially by reversing the combustion process. A field of mirrors reflects solar radiation onto a receiver at the top of a tower, where it is converted into high-temperature process heat in excess of 1.500°C. This heat drives a thermochemical reaction to convert water, methane and CO_2 into syngas which can then be made into synthetic fuel using existing technology. Excess heat can be stored during the sunny hours to power the process round the clock.

The CO_2 and methane currently come from biowaste from the paper industry, but the CO_2 can also be obtained through direct air capture or recycled from industrial processes. Indeed, Synhelion is collaborating with CEMEX on the prospect of capturing CO_2 from cement production, which gives off CO_2 in the process of calcination of limestone. Therefore, a solar fuel production plant could theoretically be located next to a cement plant and recycle its CO_2 emissions.

Policy implications

Synhelion sees conditions improving for its technology roll-out and scale-up, with the necessary funds becoming ever more available. It counts SWISS, ENI, Cemex, SMS group, AMAG Group and other among its investors.

But, says Mr Furler, to establish a market for synthetic fuels, governments must set the right incentives. The EU's ReFuelEU Aviation package will accelerate the demand in the future and defining binding, increasing quotas for the use of SAF is definitely the right way to go, he says. This quota should include a sub-quota for e-fuels and solar fuels and not just for biofuels.

Related Orgalim position papers

- Renewable Energy Directive
- Alternative Fuels Infrastructure Directive
- R&D and innovation

About Synhelion

Synhelion

Based in Lugano, Switzerland, Synhelion is a global pioneer in the field of carbon-neutral solar fuels. The company spun off from the Swiss Federal Institute of Technology (ETH Zurich) in 2016 to decarbonise the transportation sector. Industrial solar fuel production will start in Germany in 2023/2024 and the first commercial production facility is planned for commissioning in Spain by 2025. Synhelion sustainably generates high-temperature process heat beyond 1'500°C with solar radiation. This makes it possible to drive industrial processes such as fuel production and cement manufacturing with solar heat for the first time.

synhelion.com

All aboard for energy efficient rail transport

Challenge

Trains are nearly 12 times more energy efficient on average than cars per passenger kilometre and eight times more efficient than trucks per tonne of freight.[6] Shifting more passenger and freight transport from air and road to rail is therefore a key plank in European strategy to reduce emissions from the transport sector.

However, as rail networks grow, so does the energy consumption. To promote sustainable transport such as electric trains while simultaneously balancing the expanding rail infrastructure and its energy consumption, it is crucial to make rail transport as energy efficient as possible.

And where better to drive innovation in efficient rail transport than in Switzerland, which has one of the largest rail systems in Europe. Swiss people take the train more than in any other European country, travelling some 2,400km per capita in 2019.

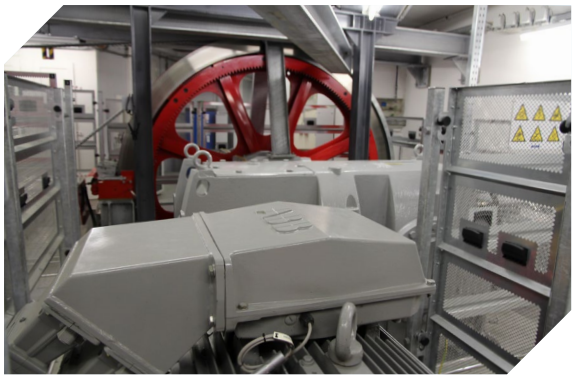
> **Energy storage systems are not only economically interesting for rail operators, but they also have a grid stabilising effect.**

Harald Hepp, Division Manager Traction, ABB Switzerland

Solution

When it comes to improving the energy efficiency of rail transport, some of the biggest potential lies in recuperating the energy from braking. Capture and convert that energy and it can be

[6] ABB White Paper



The ABB electric motor sets the seven-tonne pulley in motion

fed back into the grid or stored in an energy storage system on board, where it can then be used to reduce peak power demand.

This 'peak shaving' means electrical infrastructure can be dimensioned for smaller loads, saving costs and materials, explains Harald Hepp, Division Manager Traction, ABB Switzerland. On board energy storage also allows electric trains to bridge areas where there are no overhead lines, reducing the need to build new infrastructure. In short, energy storage systems are not only economically interesting for rail operators, but they also have a grid stabilising effect, he points out.

The benefits are applicable as much for high-speed trains as for the smallest mountain railways, of which Switzerland has more than a few. For the Biel-Magglingen funicular mountain railway, ABB partnered with Frey AG Stans, Doppelmayr-Garaventa Group, and the Lucerne University of Applied Sciences and Arts to deliver an energy management system that recuperates the braking energy. The result: a 30% drop in electricity drawn from the grid, lower peak demand, and the European Solar Prize last year in the mobility category for its 'world first' energy system.

How does it work? While the individual technologies involved may not be all that new, it is the innovative and smart combination of them that makes the Magglingen energy management system unique, Mr Hepp says.

The train cars are powered as much as possible by solar panels on top of the mountain station and energy recovered by regenerative braking, reducing the need to buy more 'expensive' electricity from the grid. The braking energy is stored in batteries, an uninterrupted power supply unit ensures the emergency operation of the rail cars, and a specialised energy management system regulates and optimises the energy flow around the clock. An additional plus point: back-up diesel generators are no longer needed.

Policy implications

As this and other projects demonstrate, the technologies needed for the emission-free transportation of the future are already available. Now it is a matter of putting them to use, says Mr Hepp. That means, first and foremost increased funding and investment to accelerate the uptake of these technologies. He cites Prokilowatt, a Swiss state development programme to support energy efficiency projects, as one example.

In short, the company (often state-owned or partly state-owned) must either see a clear financial advantage in saving energy through enhanced efficiency with regards to total cost of ownership, or be obligated to weigh the energy efficiency factor more heavily. And this is easier said than done, as projects incorporating energy efficiency measures are usually complex, with several parties involved, from the energy user to the utility, to the project leaders and the technology companies.

Related Orgalim position papers

- Energy Efficiency Directive
- Renewable Energy Directive
- Energy Taxation Directive
- Alternative Fuels Infrastructure Directive
- R&D and innovation

About ABB Switzerland

ABB is a technology leader in electrification and automation, enabling a more sustainable and resource-efficient future. Headquartered in Zurich, Switzerland, the company's solutions connect engineering know-how and software to optimise how things are manufactured, moved, powered and operated. With a strong local presence, ABB operates in Switzerland through ABB Switzerland, based in Baden.

global.abb

Innovative, agile and open for business

The three case studies in the previous section highlighted the diversity of technology solutions needed to achieve the energy transition, from compressors to electrical components to heat pumps, as well as the collaboration essential to innovate, scale-up and integrate them into new energy systems.

In this section, we zoom in to uncover the secrets of Switzerland's success as an innovative ecosystem for these technology companies tackling the energy transition, the opportunities and the obstacles, and the policy implications at both national and European level.

And who better to discuss all this with than Stefan Brupbacher, CEO of the Swiss technology industries association, Swissmem, and also the Orgalim Chair.

How would you characterise the technology industries in Switzerland that you represent and their development over the past 5-10 years?

Stefan Brupbacher: Swiss manufacturing companies have been global leaders in their niche markets for a very long time. Many of our 1,300 companies – most of which are SMEs – are under the third, fourth or even sixth generation of the same ownership. Their resilience is down to the fact that they have consistently innovated, responding to technological change and the new challenges that our society faces.

Thanks to this innovativeness, the traditional mechanical engineering, electrical engineering and electronics, and metal technologies industries that gave Swissmem its name are these days more broadly characterised as technology industries. Today the industries that we represent include a wide range of technologies and sectors from photonics to robotics, additive manufacturing, industrial ICT and, most recently, also semiconductors and medical devices.

What are the particular qualities that make Swiss engineering and tech so successful?

Stefan Brupbacher: Being a small country, we could never depend just on our domestic market alone, and so we've always needed to export and to establish subsidiaries abroad. Our industries export nearly 80% of what they produce – most of it to the EU. And they employ, besides around 320,000 people in Switzerland, also another 560,000 people around the world.

So there is a mindset that export is key and you can only compete on the global level if you're innovative and agile, even though your business may be steeped in tradition and have been in the same hands for generations. Combine that with a cultural openness and an international business culture and I think these are among the key elements that make Swiss technology manufacturing companies successful.

> **We are seeing emerging in society an understanding of how important manufacturing is for addressing the challenges we collectively face and that is an opportunity we must grasp.**
>
> **Stefan Brupbacher,** CEO, Swissmem

What do you see as the most important challenges and opportunities on the horizon for these sectors?

Stefan Brupbacher: Societal challenges, like decarbonisation, pose technological challenges but also open up tremendous business opportunities. Notably, given the theme of this report, Switzerland's natural and geographic heritage makes it particularly attuned to the energy transition. As an indication, a year and half ago, Swissmem added a thematic sector – new energy systems – to the numerous technology sectors that we cover. And it has grown in a very short timeframe to be one of our most dynamic, supporting, in part, the need for companies to cooperate in developing, manufacturing and implementing the technology solutions needed.

Overall, I believe we are seeing emerging in society an understanding of how important manufacturing is for addressing the challenges we collectively face and that is an opportunity we must grasp.

As for challenges, the risk of decoupling that we see in the wider geopolitical context is clearly a challenge for a society whose economic success is so dependent on export, even if you could argue there may also be opportunities in greater regionalisation.

How does Swissmem support companies navigating these challenges and opportunities? What services do you provide?

Stefan Brupbacher: Firstly, we engage on a political level to ensure the best possible political and economic framework conditions for our industries, whether that be low taxes or tax breaks for innovation. For example, last year, the Swiss parliament adopted legislation that will eliminate import tariffs on industrial goods imported into Switzerland from 2024, which is a major positive development.

Second, we are responsible for the apprenticeship system for our industries. Switzerland is very strong on apprenticeships – it is one of our other key strengths – and we are closely involved, even down to setting the exam questions.

Third, we provide networking and other services for our companies. As I mentioned, collaboration is increasingly vital to deliver the innovative technology solutions we need for, for example, new energy systems. Especially for SMEs. So we support our companies with exporting, or with establishing research partnerships, or with applying for public funding for their R&D. We also, together, with our sister employers' association, negotiate Switzerland's oldest collective bargaining agreement.

Last but certainly not least, we have a legal department, that supports our members in answering all sorts of legal questions. Our team of ten lawyers gets 600 to 700 calls a week on anything from labour issues to exporting, to questions about compliance relating to dual use.

What are your current policy and strategic priorities, and why?

Stefan Brupbacher: Reforming the apprenticeship system is a major project this year and in the coming years. Skills shortages are a problem for technology industries worldwide, and Switzerland is not immune, despite our relatively strong position on this score.

Linked to this is a broader communications priority. Since many of our companies operate in the business-to-business realm, we do not have so many direct channels to citizens – be that young people to encourage them to consider a career in the tech industries, or citizens who may not be so aware of the importance of our industries in dealing with the bigger societal challenges we all face, but who vote regularly in referendums which are relevant to our industries, like the country's CO_2 Act.

> **We are stepping up our communications efforts to show people how important our industries are in their daily lives and what some of our companies are doing, for example to fight climate change or improve energy efficiency.**
>
> **Stefan Brupbacher,** CEO, Swissmem

Stefan Brupbacher

Dr. Stefan Brupbacher has been CEO of Swissmem since 2019. He studied law at the University of Zurich and received his doctorate there. He also holds an Executive Master in International and European Business Law from the University of St. Gallen and a Master in International Affairs specialising in International Economics from the John Hopkins University (SAIS) in Bologna and Washington DC. From 2014 to 2018 he was Secretary General of the Federal Department of Economic Affairs, Education and Research (WBF). Prior to that, he was Secretary General of FDP party in Switzerland, and gained a broad range of professional experience also in previous roles. In November 2022 he was elected Chair of Orgalim, having previously been its Vice-Chair.

About Swissmem

With a history dating back 140 years, Swissmem is the leading association for both SMEs and major corporations in the Swiss technology industry. It represents around 1,300 companies in the mechanical engineering, electrical and electronics, ICT and metal technology (MEM) sectors, who between them directly employ around 320,000 people, making them collectively the biggest employer in Switzerland. Some 85% of the companies are SMEs.

Swissmem provides its members with professional advice, offers them extensive networks and supports them in digitalisation while also, at a political level, advocating for good framework conditions and an innovative centre of industry in Switzerland. The focus is on access to global export markets, the effective promotion of innovation, and a liberal labour market.

Vocational education and training is another important part of the association's responsibilities, from apprenticeships training to advanced training courses. In doing so, it aims to contribute to an innovative, internationally competitive industrial centre, as well as stability and prosperity in Switzerland.

Martin Hirzel has been President of Swissmem since 2021. Stefan Brupbacher has been its CEO since 2019.

swissmem.ch

So we are stepping up our communications efforts to show people how important our industries are in their daily lives and what some of our companies are doing, for example to fight climate change or improve energy efficiency.

Then on the policy side, one continuing priority is to speed up the permitting process for renewables infrastructure because, for the past 10 or 15 years we have had virtually no investment here because everything has been blocked. This is of course, not just an issue in Switzerland, but everywhere in Europe and we shouldn't waste this crisis to get this problem addressed.

Aside from permitting, on the European level, which issues do you work on most closely with Orgalim? What is the added value of this European-level collaboration for you?

Stefan Brupbacher: Some 58% of our exports go to the European Union and, besides that, we sit right in the middle of a highly integrated economic cluster – that we call the Alpine industrial cluster – of mechanical and electrical engineering firms. And since the EU sets a lot of the regulations, it is key that we participate, through Orgalim, as a non-EU member in the regulation setting process.

The Machinery Directive has been one very important legislative file, where Orgalim has done a very, very good job of representing the interests of our sectors. Then there is the issue of the sustainable finance taxonomy where we feel that, over the past year, they have played an important role in starting to convince the Commission of the importance of including the enabling technologies that our industries provide. And more broadly there is the whole question of Europe's industrial competitiveness.

To what extent are you impacted by the lack of agreement on the Institutional Framework Agreement (IFA) between Switzerland and the EU to restructure and streamline EU-Swiss trade relations?

Stefan Brupbacher: On a day-to-day level, I think our relations with the EU are very good, thanks to our very deep integration into the common market. What is much more dangerous for our companies is the strategic insecurity over period of five to 10 years. So it's not necessarily any one single issue, it's more the accumulated uncertainty which companies just hate. With the war in Ukraine, it is more important than ever that Europe pulls together, so we really hope that we will find a solution to the issues with the IFA this year.

Switzerland's innovation ecosystem and the Swiss technology industries

64% OF SWISS UPPER SECONDARY STUDENTS BENEFIT FROM VOCATIONAL EDUCATION & TRAINING

2 SWISS UNIVERSITIES IN THE TOP 20 QS WORLD UNIVERSITY RANKINGS 2023

SWITZERLAND IS

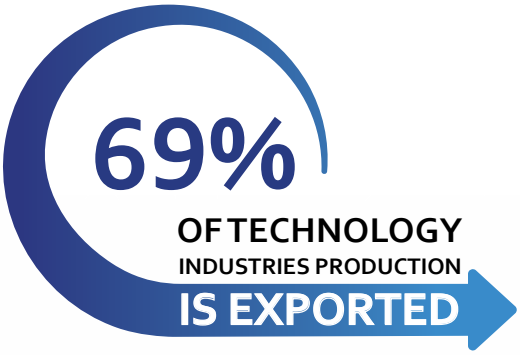
IN THE GLOBAL TALENT COMPETITIVENESS INDEX 2022 & GLOBAL INNOVATION INDEX 2022

TECHNOLOGY COMPANIES IN SWITZERLAND REPORTED 2021 TURNOVER AT

₣98.8 BILLION

7%

OF SWISS GDP IN 2021



SWISS TECHNOLOGY INDUSTRIES EMPLOY

320,000 IN SWITZERLAND

+ 560,000 WORLDWIDE

Sources

Global Innovation Index 2022
OECD Education at a Glance 2020
QS World University Rankings 2023
Swissmem
eda.admin.ch
2022 Global Talent Competitiveness Index

Orgalim is committed to championing an EU policy agenda for sustainable growth, to supporting the industry in its transformation, and to advancing dialogue between business, policymakers and citizens on the relationship of technology to society.

Orgalim's Technology at Heart series presents stories showcasing how the technology industries we represent are shaping a future that's good for Europe's economy and society – and how the right policy framework can help them do even more.

Orgalim represents Europe's technology industries, comprised of 770,000 innovative companies spanning the mechanical engineering, electrical engineering, electronics, ICT and metal technology branches. Together they represent the EU's largest manufacturing sector, generating annual turnover of €2,497 billion, manufacturing one-third of all European exports and providing 10.97 million direct jobs.

We are a European-level federation that engages with EU policymakers on behalf of our membership, speaking for 29 national member associations and 20 European sector associations. Founded in 1954, and with hundreds of industry experts engaging across a broad range of policy areas, we are recognised as the foremost voice of Europe's technology industries in Brussels. Our advocacy work addresses the broad spectrum of policy and regulatory issues that impact our companies, while our Partnership services provide support to a broader network of clients in the field.

ORGALIM REPRESENTS:

49 Associations

22 Countries

29 National member associations

20 European sector associations

3 Industries: mechanical engineering; electrical engineering, electronics and ICT; metal technology

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