

Powered by



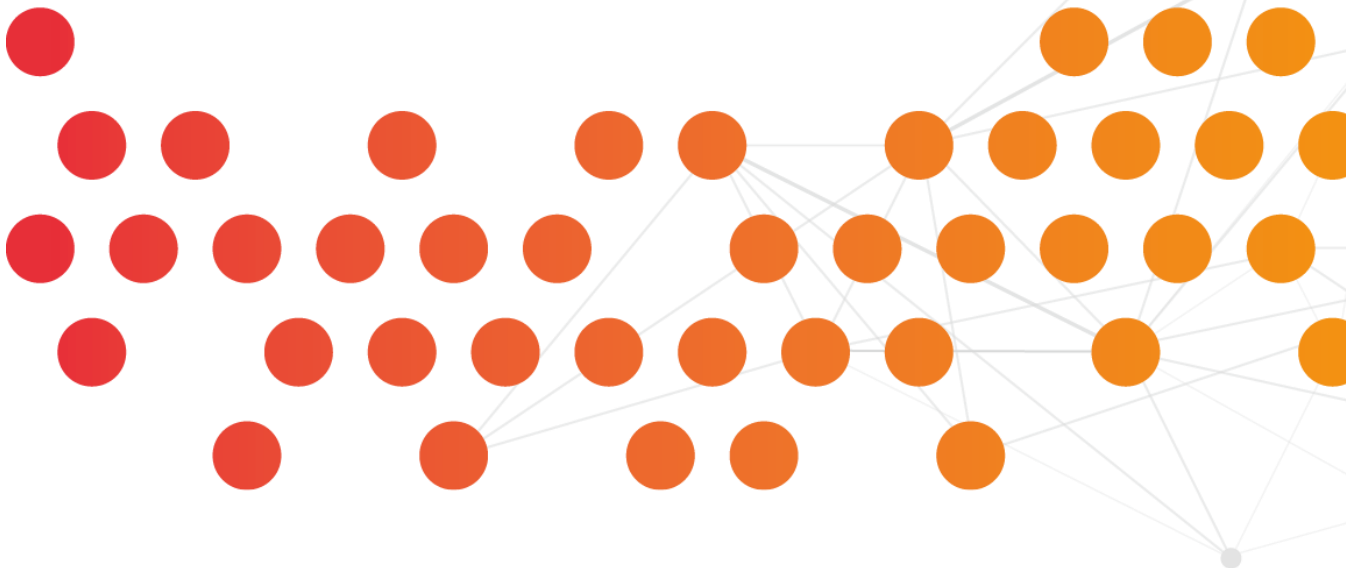
**Start Up  
Energy Transition**  
Global Innovation Platform

---

# **SET Partner Country Report**

## The Swedish Energy Innovation Ecosystem

---





# SET Partner Country Report

## The Swedish Energy Innovation Ecosystem

### Start Up Energy Transition (SET)

SET is a global innovation platform supporting advance in the global energy transition. SET is implemented with the conviction that a sustainable future is directly linked to innovative business models and political will. The SET platform is powered by the German Energy Agency (dena), in cooperation with the World Energy Council.

At the core, the SET platform is comprised of the SET Award, the SET Tech Festival, and a growing global network. In addition, each year SET publishes a SET100 list – a list of the top 100 most innovative, savvy and promising start-ups. The SET Tech Festival offers access to the best start-ups and most outstanding entrepreneurs in the field of energy solutions, in addition to innovation-driven corporates, investors, and public organisations leading the energy transition.

### Purpose of the Report

Sweden, through the Swedish Energy Agency, is an official partner of the SET 2020 Tech Festival and Award. Sweden has been a friend to SET projects since its very beginnings and has consistently been represented by start-ups, investors, energy stakeholders, and jury members. The country boasts one of the world's most active start-up ecosystems. Simply put, for every 1000 employees in Sweden there are 20 start-ups. Naturally, venture capital funding in Sweden is rising progressively, and Stockholm is referred to as Europe's "unicorn factory".

Time and time again, Sweden has featured amongst the top countries for doing business according to Forbes magazine. As recently as 2017, Sweden was selected as the #1 best country for doing business, which bases its results on a study of 153 nations and on 15 different factor including innovation, taxes, technology, infrastructure, market size, freedom (personal, trade and monetary), and investor protection. In the 2020 edition Sweden ranked first in both innovation as well as personal freedom, two aspects that lend to a flourishing start-up ecosystem.

The following report offers a brief background of Sweden's energy transition with a focus on the innovative and unique start-up ecosystem and highlights the partnership between SET and Sweden. This report has been compiled together with the World Energy Council, the Swedish Energy Agency and the German-Swedish Chamber of Commerce.

### Partners:



Tysk-Svenska Handelskammaren  
Deutsch-Schwedische Handelskammer



# Leadership Statements

---

## **Andreas Kuhlmann, CEO, German Energy Agency**



"SET has been proud to host a global platform which engages start-ups and a multitude of energy sector stakeholders. We are convinced that international cooperation is crucial to achieving the global goals that we have set to address climate change. As Sweden is renowned for innovation and as a "unicorn factory", we are proud to cooperate with them for SET. With the help of our partners at the Swedish Energy Agency, the German-Swedish Chamber of Commerce, and the World Energy Council, we hope to inspire new entrepreneurs to take the leap and contribute to building a greener and more sustainable future."

---

## **Dr. Angela Wilkinson, Secretary General and CEO, World Energy Council**

"The World Energy Council is delighted to be an active partner in developing new and better energy solutions with the Swedish Energy Agency and the German-Swedish Chamber of Commerce. Now in its fifth year, SET, to which we are proud to be dena's strategic partner, has grown considerably and brings together the next generation of energy entrepreneurs from all regions of the world. As an open global community of energy pioneers, pathfinders, and road builders of better energy futures, we congratulate our Swedish partners for their collaboration in promoting the ecosystems that support energy transition entrepreneurship."



## **Dr. Ralph-Georg Tischer, CEO, German-Swedish Chamber of Commerce**



"Innovation is key to a successful economic development and start-ups are innovation drivers. At the same time, international cooperation is an essential factor for an innovation's breakthrough. Therefore, start-up promotion is a matter of the heart for the German-Swedish Chamber of Commerce and we are very happy to support Swedish start-ups contributing to a future green energy system through the Swedish-German Cleantech Platform together with our partner, the Swedish Energy Agency. The centrepiece here is the matchmaking between Swedish start-ups and German corporates, which we arrange through individual business partner brokerages."

---

## **Robert Andrén, Director General, Swedish Energy Agency**

"The Swedish Energy Agency has, through our financial as well as market entry support programs for innovation and commercialisation, supported more than 200 innovations over the past one and a half decades. With a survival degree of more than 80 %, this new generation of start-ups work the forefront of climate change mitigation by delivering important transformative solutions. Together these solution providers will make a difference and actually have a potential of reducing GHG emission by more than 1 Gigatonne."



# Energy Market Overview

---

Sweden has an exceptionally promising energy transition track record, driven by policies targeting energy efficiency, renewable energy, sustainability and climate neutrality. This includes giving preference to technology neutral processes as well as implementing the highest carbon tax globally with the aim to reduce emissions. Its overarching energy policy goals call for achieving 100% renewable power by 2040 and net zero carbon emissions by 2045. In line with this, Sweden is expecting to gradually see its outdated power plants shutting their doors and a drastic rise in demand for sustainable and innovative energy sources.

Sweden was already able to reach its 2020 target of [50% renewable as early as 2012](#). In 2018, the renewable share of total energy consumption of Sweden reached 54.6%, the highest among EU countries. Furthermore, as of 2017, according to the International Energy Agency (IEA), Sweden has the [second-lowest CO2 emissions per GDP and per capita](#) among IEA member countries as well as the lowest share of fossil fuels in its primary energy supply. Sweden recorded a [31.4% reduction](#) in the carbon intensity of energy between 1990 and 2018, the greatest reductions along with Finland and Denmark among EU countries.

Today, electricity generation is virtually decarbonised due to large access to hydro, bioenergy, and in recent years wind power, while only 0,02% are non-renewable energy sources. Other energy sources such as solar PV have been greatly expanded, as shown by a [52% increase](#) in the number of grid connected solar PV systems from 2016 to 2017. By 2017 this amounted to roughly 15,300 PV systems, with a combined installed power of 231 MW throughout Sweden. In addition, other energy sources such as wave power, geothermal energy, bioenergy or hydrogen are becoming increasingly relevant.

An important goal for Sweden's continuing decarbonisation efforts is to reduce fossil fuel use, which is still extensive albeit decreasing, especially in transportation. In 2016, Sweden's transport sector was largely powered by petroleum products ([68% of final energy use](#)). To a lesser extent, the industry sector's final energy consumption consists of 32% fossil fuel-based energy while relying heavily on biofuels ([38.9%](#)) and electricity ([31.6%](#)). In the residential and service sector only 8% of final energy use stems from fossil fuels. For that reason, most decarbonisation efforts are targeting the transport sector, for instance road transport or the maritime sector. Sweden has set a target to reduce transport emissions by [70% before 2030](#), compared to 2010.

# Swedish Energy Innovation

## Support for Clean Energy Development

Initially established in response to the global oil crisis, the Swedish government began funding a national energy research, development and demonstration programme in 1975. Over the course of the past decades, Sweden has emphasised its intent on addressing the country's dependency on oil and transitioning to more sustainable sources of energy.

Today, Sweden promotes the development of clean energy through various protocols, including renewable electricity through a quota system, tax regulation mechanisms, and a subsidy scheme. Tax exemptions are one of the main incentives to support renewable cooling and heating. Another incentive for renewable energy use is a tax exemption for biofuels. This is particularly relevant for the transport sector, which accounts for less than 25% of Sweden's final energy consumption, but over half of its energy-related CO2 emissions. Grid operators are obliged to connect electricity generation systems to the grid, transmit electricity, and focus on expanding their grids. With regard to government policies promoting the development of renewable energy, grants for research and development (R&D) in different energy fields are offered for the installation and use of renewable energy sources.

## The Start-up Ecosystem & Support Mechanisms

Start-ups and new businesses are reliant on a stable infrastructure and regulatory framework to reduce uncertainty. Hence, it is important that governments promote the establishment of such structures and provide support mechanisms for start-ups. This is particularly true for those invested in energy transition, as their development and success are implicit in the local and global goals for a green future.

Sweden has proven through its government policies as well as its investment scene that it gives great importance to the cultivation of energy start-ups. More [billion-dollar firms per capita](#) currently exist in Stockholm than any other city in the world outside

of Silicon Valley. Thus far, 20 Swedish businesses have surpassed the USD 10 billion revenue threshold. There are currently [more than 10,000 start-ups in Stockholm](#), which has a population of

almi invest

*"The support ladder from university research, through grants, seed funding and growth funding with a good blend of state and private capital is a good system that I think can be something to learn from. What could be improved is to include more of the society in creating innovation, such as female founders and 1st and 2nd generation new citizens."*

Markus Hökfekt, Fund Manager  
Almi Invest GreenTech

---

approximately 975,000 residents. Sweden also boasts 29 accelerators and incubators, many of which are favourable to energy themed innovations. Through supporting start-ups from grassroots stages to the heights of Spotify, Skype and countless other success stories, Sweden has proven a fertile ground for ambitious businesses to develop.

Sweden's commitment to investing in innovation is also proven by its spending towards R&D. More than 3% of the country's GDP is reinvested into R&D annually. In 2019, the total expenditure on [R&D in Sweden](#) amounted to just under SEK 171 billion (approx. EUR 16.7 billion). This marks an SEK 7.1 billion (approx. EUR 693.7 million) increase since 2017. Vinnova, the Swedish government's agency administering innovation, plays a central part in this context. Vinnova is an innovation agency that promotes and funds research projects in a wide range of fields, including energy and technology.

In addition, platforms like the Nordic Innovation House, co-funded by Nordic government agencies responsible for business growth, have employees around the world offering soft-landing programmes for Nordic start-ups abroad. This gives Swedish start-ups a head start in the most relevant global innovation hubs by offering them a strong community and connections to accelerate their growth. Such platforms exemplify Sweden's support for start-up endeavours both within the country as well as abroad. Nonetheless, greentech and climate related start-ups have faced challenges due to longer lead times for development, higher CAPEX demands, dependencies on industries, and subsidies. This is a trend seen

globally, as investors tend to favour funding ready-to-go projects. However, according to Markus Hökfelt, Fund Manager at Almi Invest Greentech, there is a shift in these trends within Sweden



*"Swedish start-ups are working out of a unique region of the world that has a very strong tradition of cooperation and working with sustainability. This gives Nordic start-ups a unique outlook on solving issues that might not today have a direct customer – but one that will in the future."*

Gustav Stenbeck, CEO  
Mestro

---

and beyond, as macro-drivers are gaining in strength and greentech companies have proven their ability to create long-term profitable returns. This is also reflected in the emergence of mini-corns like Northvolt, Exeger, Climeon, and more.



*"The entire Swedish innovation ecosystem has a governmental mission to support the internationalisation of innovation, while many incubators, accelerators and science parks do this locally and regionally."*

In addition to the various support mechanisms for local start-ups, the Swedish ecosystem also benefits from the government's active efforts to facilitate the move of foreign talent to Sweden. There are various public and private institutions supporting energy start-ups in their entry into the Swedish market. Among the various initiatives, the German-Swedish Chamber of Commerce has for example launched the German Swedish Tech Forum. Additionally, regional investment promotion agencies, like Business Region Göteborg and Stockholm Business Region, along with various other chambers of commerce are increasingly making it a priority to attract international businesses to Sweden. Among various initiatives, the German-Swedish Chamber of Commerce has for example launched the German Swedish Tech Forum. In Sweden's recent export

strategy, government affiliated organisations like Business Sweden were cited as a key channel for attracting talent to Sweden and supporting the onboarding of start-ups and scale-ups into Sweden.



Tysk-Svenska Handelskammaren  
Deutsch-Schwedische Handelskammer

### **Swedish-German Cleantech Platform**

The Swedish Energy Agency and the German-Swedish Chamber of Commerce jointly operate the Swedish-German Cleantech Platform, which is designed to support Swedish cleantech companies in entering the German market. The program is based on many years of successful collaboration between the Chamber of Commerce and the Swedish Energy Agency. The program is aimed at companies that are contributing to the Swedish and global energy transition to 100 percent fossil-free energy and are ready to internationalise. The focus areas include renewable energies, energy efficiency, energy storage, intelligent power grids, e-mobility and charging infrastructure as well as alternative fuels and intelligent buildings. The aim of the program is that the participating companies get to know the German market, identify pilot projects in which they can participate and meet potential customers and partners. A program duration is one year.

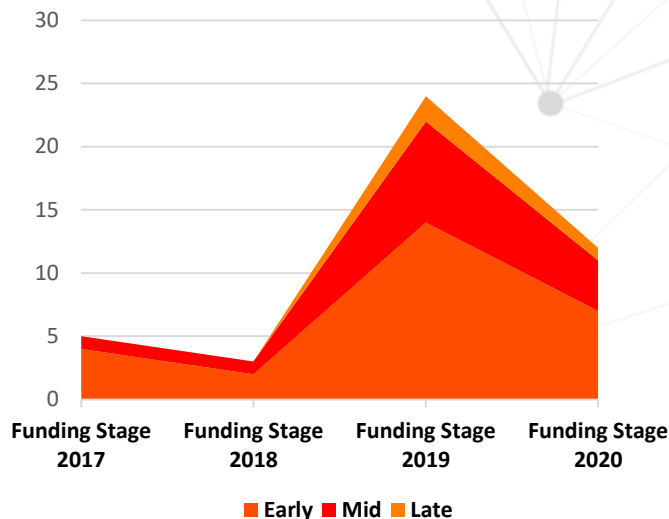
# Sweden and the SET Award

Since the first edition of the SET Award in 2017, **44 Swedish start-ups have applied**. Between 2017 and 2020, **10 Swedish start-ups have featured in the SET100 list**. The SET100 list is an annual compilation of the 100 best start-ups of the SET Award. It contains the most innovative and promising start-ups that make the energy transition a fundamental component of their innovation. Since 2017, amongst the countries most represented by start-up applicants, **Sweden ranks third** following Germany and France.

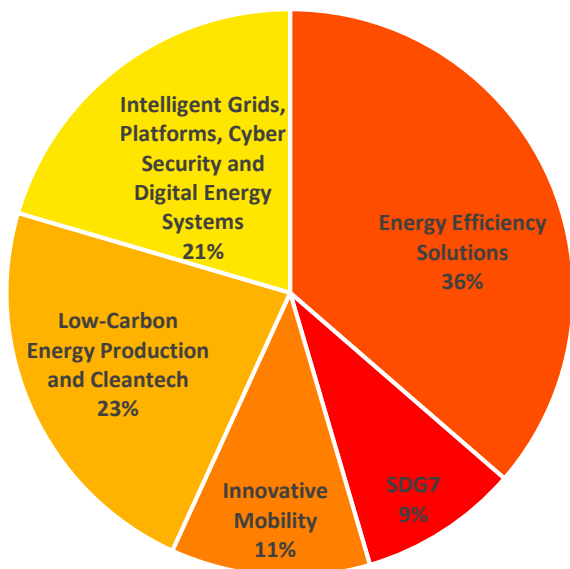
In the build-up to the SET Award, each year three finalists are selected per category from which one winner is gifted the SET Award for their respective category. Thus far

**five Swedish start-ups have featured as finalists and one has won the SET Award**. In 2019, Blixt earned the SET Award in the Energy Efficiency, Smart Devices & Storage category. Since 2019 alone, Sweden has been represented by 36 start-up applicants for the SET Award (24 in 2019 and 12 in 2020).

Swedish SET Start-up Funding Stages 2017 - 2020



Swedish SET Application Categories 2017-2020



## BLIXT

Blixt was founded in 2018 with the goal of bringing grid-edge data intelligence to the energy supply market through the introduction of digital circuit breaker technology. Mechanical circuit breakers have been the gatekeepers of household electricity supply for around 150 years, but Blixt's digital alternative will be a game-changer for the future of electricity management. Blixt's solid-state circuit breaker is a response to emerging trends in global energy markets and aims to satisfy the growing demand for "grid-edge intelligence" from both consumers and power network infrastructure.





Powered by



**Start Up  
Energy Transition**

Global Innovation Platform



Scan here to access the full interview  
with Markus Hökfelt, Fund Manager,  
Almi Invest GreenTech



Scan here to access the full interview  
with Gustav Stenbeck, CEO, Mestro



Scan here to access the full interview  
with Charlotta Holmquist, Executive  
Chairwoman and Co-Founder of Blixt

**For further information please contact:**

Deutsche Energie-Agentur GmbH (dena)  
German Energy Agency  
Chausseestrasse 128 a  
10115 Berlin, Germany

Tel.: +49 (0)30 66 777-778

Fax: +49 (0)30 66 777-699

E-mail: [kechrid@dena.de](mailto:kechrid@dena.de)

Internet: [www.dena.de/en](http://www.dena.de/en)