

Pilot project on industrial transition

*Material on Norra Mellansverige used for the peer
learning workshops organized by the European
Commission and OECD spring 2018*

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1 Introduction

In July 2017 the European Commission presented new ways to help regions build resilient economies in new times by going further with the regional smart specialisation strategies. One of the actions initiated was two new pilot projects and Norra Mellansverige was selected to participate in the pilot “Tailored support for the specific challenges on regions facing industrial transition” (European Commission 2017; 2018a).

The purpose of the pilot project is to make Europe more competitive and resilient in a world that is changing. Globalisation, decarbonisation and new digital technologies are some of the things that the industrial regions in Europe have to face. However, many of these regions are tackling challenges such as lack of relevant skills, high labor costs and difficulties in attracting investments. By tailored support from the EU and the OECD, the aim of the pilot project is to help strengthen the regions’ innovation systems and develop their competitive assets, as well as to provide tools to enable access to new markets. The regional smart specialisation strategies constitute an important part of the pilot project, by focusing on what the regions can do best (European Commission 2018a).

Norra Mellansverige (constituting of Värmland, Dalarna and Gävleborg), as many other European regions, is undergoing a transition in the traditional industry. In Sweden there has been a general shift from low-skill jobs to high-skill jobs which is making it difficult for an industrial region as Norra Mellansverige to keep up. For that reason, Norra Mellansverige decided to apply for the pilot, and in December 2017 the European Commission presented the region as one of the selected. In the first round of the pilot project five regions including Norra Mellansverige are participating. The other four regions are Hauts-de France in France, Piedmont in Italy, Wallonia in Belgium and Saxony in Germany. In the next round, presented in March 2018, seven other regions were selected (European Commission 2018b).

The pilot project was launched on the 7th of March 2018 at the European Commission’s headquarter Berlaymont. At the meeting regional representatives participated, as well as the commissioner for regional policy, Corina Crețu.

During the spring of 2018 five peer-learning workshops were organized by the OECD. The workshops touched upon different topics to support the regions to develop strategies for comprehensive industrial transition. During the first workshop the regional representatives from Norra Mellansverige found a need to have more information about the region to get as much as possible out of the workshops. Since most of the statistics and regional information come from each of the individual regions (Värmland, Dalarna and Gävleborg) alone, there was a need to collect and gather information on Norra Mellansverige. Therefore, the aim of this material is to present general information on the region based on the different themes of the workshops:

- Broadening innovation and innovation diffusion
- Low-carbon energy transition
- Promoting entrepreneurship and mobilising the private sector
- Inclusive growth

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2 Workshop 2: Broadening innovation and innovation diffusion

This material is aimed for the second workshop on the theme “Broadening innovation and innovation diffusion” that seeks to address the questions:

- What are the best ways to broaden innovation or innovation diffusion through smart specialisation? Do they differ depending on the regional context, such as levels of development or institutional capacity?
- What can policy do to foster technology diffusion and help closing the gap between frontier regions and the rest? Can "pockets of excellence" be developed as a bridge to addressing the productivity gap?
- What other factors – such as skills, entrepreneurial culture, engagement of the private sector or industrial modernisation – require special attention from policy makers within or as a complement to broaden innovation policy?

The material is primarily based on statistics from the Regional Innovation Scoreboard 2017 and the EU Regional Competitiveness Index 2016, together with statistics from Eurostat, the State of the Nordic Region 2018 and complementary information from specific regional reports.

Norra Mellansverige in an European perspective

The Regional Innovation Scoreboard 2017 scores Norra Mellansverige as a “strong innovator” (the different groups are modest innovators, moderate innovators, strong innovators and innovation leaders) with an index of 102.7 (EU average = 100) and a ranking of 92 out of 220 regions. Strong innovators include in total 60 regions in Europe with a performance between 90 % and 120 % of the EU average and they are further divided into three subgroups (strong +, strong and strong-), where Norra Mellansverige is included in the middle subgroup “strong” (European commission 2017a) (see Annex 1, figure 1).

Relative to the EU, Norra Mellansverige’s strengths are lifelong learning, non R&D expenditures, innovative SMEs collaborating, EPO patent applications and design applications while the weaknesses relative to the EU are tertiary education, international scientific co-publications, R&D expenditure public sector, R&D expenditure business sector, product/process innovations, marketing/ organisational innovations, public private co-publications, trademark applications, employment MHT man. + KIS services, exports of MHT manufacturing and sales new-to-market/firm innovations. Norra Mellansverige scores the same as the EU average on the indicators most-cited scientific publications and SMEs innovating in-house (European commission 2017a) (see Annex 1, figure 2).

In the EU Regional Competitiveness Index 2016 Norra Mellansverige scores an index of 0.19, which is a bit better than the EU28 average of 0.0 (see Annex 2, figure 4). Furthermore, the region gets a score of 62.6 out of a maximum of 100 and is ranked as 111 out of 263 regions. The strengths relative to the 15 regions with most similar GDP are macroeconomic stability, health, higher

education and lifelong learning while the weaknesses are market size and business sophistication. Indicators that are neither strengths nor weaknesses are institutions, infrastructure, basic education, labour market efficiency, technological readiness and innovation (European Commission 2017b) (see Annex 2, figure 5-6).

Furthermore, The EU Regional Competitiveness Index divides the different scores into three groups: basic pillars, efficiency pillars and innovation pillars (see Annex 2, figure 5-6). While Norra Mellansverige scores above the EU average for the basic pillars and along with the EU average on the efficiency pillars, the region scores below the EU average on the innovation pillars (see Annex 2, figure 7). The report also shows that Norra Mellansverige has scored the same Regional Competitiveness Index from 2010 to 2016 (European Commission 2017b) (see Annex 2, figure 8).

R&D expenditure

According to the Regional Innovation Scoreboard 2017 the expenditures on R&D are low in Norra Mellansverige (European Commission 2017a). In the function analysis of Dalarna the region scores 60 on renewal ability, while the average for Sweden is 100. One of the factors that is notable is the low expenditure as a part of GRP (Gross regional product) for research located to the academies, where also Värmland and Gävleborg score well below the national average (Kontigo 2012) (see Annex 3). Statistic from Eurostat shows that Norra Mellansverige has an expenditure of 474.8 euro/inhabitant on intramural R&D, while the average for the EU28 is 593.5 (Eurostat 2018a).

In the State of the Nordic Region 2018 it is shown that that the R&D expenditure, including business, enterprise, higher education, and government sector, has decreased in Värmland, decreased or stayed at the same level in Dalarna and increased in Gävleborg between 2007-2015. The changes are though very low (Nordregio 2018) (see Annex 4, figure 10).

Furthermore, the State of the Nordic Region 2018 also show that the Foreign Direct Investments (FDI) has decreased in Värmland and Dalarna, while it has increased in Gävleborg between 2003-2016. The FDI intensity was on the other hand a bit higher in Dalarna (250-500 million euros), than in Värmland and Gävleborg (100-250 million euros) between 2003-2016 (Nordregio 2018) (see Annex 4, figure 11).

Innovation system

Norra Mellansverige scores low in the Regional Innovation Scoreboard 2017 on the ability for SMEs to introduce new innovations to their markets.

The function analysis of Dalarna shows that there are many entrepreneurs amongst the working force, and Dalarna, Gävleborg and especially Värmland have a high degree of young people who have participated in “Ung Företagssamhets utbildningskoncept”. Dalarnas innovation system is well functioning in the beginning, with many actors supporting the startup phase for companies. The system for actors promoting innovation is on the other hand not as developed. Since the support for innovation is often linked to the academy, the function analysis suggests all three regions to work together and

connect their academies and thereby enable new possibilities to use the academies more efficient in the regional innovation system (Kontigo 2012).

The analysis of clusters in Norra Mellansverige shows that the clusters seem to have a higher degree of intensity and activities than they show ability for long-term sustainability. The clusters often pursue innovation and internationalization even though they have not developed into a sustainable cluster. The fact that the clusters are often depending on financial support for projects, and even for their basic activities, make them vulnerable in the long-term (Oxford Research 2017).

The clusters in Norra Mellansverige are in general strong regarding activities and cooperation, but on the other hand many of the clusters do not experience an added value regarding innovation and internationalization. It seems like many of the clusters are satisfied with the contacts they have with the public actors and other companies (Oxford Research 2017).

Export

The function analysis of Dalarna shows that the export for all the three regions (Dalarna, Värmland and Gävleborg) constituted a bigger part of the total GRP in 2012, than the export did for the average GRP in Sweden (Kontigo 2012). However, the Regional Innovation Scoreboard 2017 shows that the exports of medium-high and high-tech technology intense manufacturing is below the Swedish, as well as the EU average (European Commission 2017a) (see Annex 1, figure 1).

Education and employment

In the Regional Innovation Scoreboard 2017 Norra Mellansverige scores below the EU average regarding employment in medium-high /high tech manufacturing and knowledge-intensive services as a percentage of total work force (European Commission 2017a). Looking at the State of the Nordic Region 2018 on the other hand, Norra Mellansverige scores the same level as the EU average with a percentage between 40-50% on employment in high technology manufacturing and knowledge- intensive service sectors as a share of total employment in 2016 (Nordregio 2018) (see Annex 4, figure 12).

Statistic from Eurostat shows that Norra Mellansverige has 220 100 persons with tertiary education and/ or employed in science and technology. To compare, the region of Stockholm has 924 500 and the region Piemonte in Italy, that is also participating in the pilot project on industrial transition, has 773 300 (Eurostat 2018b)

Horizontal criteria

Criteria as “index of dissimilarity” and the percentage of foreign born individuals amongst the employed are basic prerequisites in the REG LAB innovation index. These kinds of indicators aim to measure how open and tolerant a region is, and they represent important criteria to appeal a new and creative working force.

The cluster analysis of Norra Mellansverige shows that these kinds of criteria are not always well-developed. There is a lack of understanding on how goals on equality and non-discrimination etc. can be integrated in the everyday work

amongst the clusters (Oxford Research 2017). Furthermore, an analysis of Värmland shows a labour market dominated by men and with difficulties to attract women to some sectors (Kontigo 2018). The horizontal criteria are not included in the Regional Innovation Scoreboard and the EU Regional Competitiveness Index.

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3 Workshop 3: Low carbon energy transition

This material is aimed for the third workshop on the theme “Low-carbon energy transition” that seeks to address the questions:

- What are the challenges and opportunities for regions resulting from the transition to a low carbon economy?
- How can regional policies and smart specialisation help in making the transition to a low carbon economy happen, while harnessing the economic potential of this transition and limiting downsides?
- How can national policies help regions during this transition? How can the private sector be engaged in the process?

The material is primarily based on statistics from the Commission’s statistical pocketbook “EU energy in figures” from 2017, from the Eurostat statistical book “Energy, transport and environment indicators” from 2017 and from the report “Energiläget 2017” from Energimyndigheten. Complementary statistics from regional reports have also been used.

Most of the statistics are on national level and to enable comparison Finland has been used as a reference country. Sweden and Finland share many similarities as Nordic countries with the forest, chemical and metal industries etc. as important parts of the total industry (Statistikcentralen 2014; Ekonomifakta 2018). Furthermore, the industries in the countries stand for almost an equal share of their gross added value (Eurostat 2017a).

Sweden’s energy consumption in an European perspective

The energy consumption / GDP in 2015 was 125-150 toe per million euro PPS (Eurostat 2017b) (See Annex 1). That is higher than Denmark, but lower than Finland.

In 2016 53.8% of the Swedish gross final energy consumption¹ came from renewables, compared to 38.7% in Finland and 17.0 % in the EU28 (Eurostat 2018). Sweden is thereby the country in the EU28 with the highest share of renewables.

Gross inland consumption² is another way to measure energy consumption in the country, by looking at the quantity of energy needed to satisfy inland consumption. The statistical pocketbook “EU energy in figures” shows that the gross inland consumption for Sweden was 45.47 Mtoe 2015. Out of that, petroleum and product of which Crude and NGL constituted 19.82 Mtoe, closely followed by 19.19 Mtoe (42.2%) coming from renewables. The EU28 total gross inland consumption was 1627.5 Mtoe and only 211.0 Mtoe (13%) came from renewables. Sweden also had a higher share of renewables than the reference country Finland, that had a gross inland consumption of 33.16 Mtoe

¹ The Gross Final Energy Consumption from renewable sources constitutes of the gross final consumption of electricity from renewable energy sources + gross final consumption of energy from renewable sources for heating and cooling + final consumption of energy from renewable sources in transport.

² The Gross Inland Consumption is the quantity of energy needed to satisfy inland consumption.

and approximately on third, 10.49 Mtoe (31,6%), from renewables (European Commission 2017).

Energy supply and energy consumption by fuel/product

The total energy supply in Sweden was 548 TWh in 2015. From that, 155 TWh (30%) came from nuclear power followed by 148 TWh from fossil fuels. Biofuels constituted 134 TWh of the total energy supply (See Annex 2, figure 3) (Energimyndigheten 2017).

Looking at the energy consumption by fuel/product in 2015, the three biggest fuels/products were electricity (122 TWh) followed by oil products (91 TWh) and biofuels (84TWh) (See Annex 2, Figure 1). The energy losses keep decreasing in Sweden. (Energimyndigheten 2017).

In 2015, 81 % of the electricity came from hydro power (75TWh) and nuclear power (54TWh). The share of wind power has increased the last couple of years and was the third biggest electricity provider with 16TWh in 2015 (Energimyndigheten 2017).

Energy consumption in the industry

Looking at the energy consumption by sector, the industry was the second biggest consumer in Sweden in 2015 with 140 TWh out of a total 370 TWh. The biggest sector was the accommodation- and service with 144 TWh (Energimyndigheten 2017).

The industry in Sweden constituted 36.3% (11.53 Mtoe of a total of 31.76 Mtoe) of the Final Energy Consumption³ (2015). For the EU28 the industry constituted 25.3% (274.7 Mtoe of a total 1084.0 Mtoe), and for Finland 44.3% (10.70 Mtoe out of a total of 24.18 Mtoe) out of the total final energy consumption. The final energy consumption for the industry in Finland was as a percentage bigger than for Sweden in 2015.

The industry sector, together with the district heating sector was, with 70% of the total use, the biggest users of biofuels in Sweden. In 2015 Biofuels alone stood for 40% (57TWh) of the total energy consumption in the industry, closely followed by 35% (49TWh) from electricity (Energimyndigheten 2017). The increase in the use of biofuels in the industry is mainly a result from a transition from oil to biofuels in the pulp and paper industries. The pulp and paper industries stood for 90% of the total use of biofuels in the industry (See Annex 2, Figure 4) (Energimyndigheten 2017).

The paper and pulp industries total use of energy in Sweden 2015 was 73 TWh, with 51 TWh coming from bio fuels and 20 TWh coming from electricity. Often the paper and pulp industry produce their own bioenergy that they can use in the industrial processes. The iron-, steel and metal industries consumed in total around 21 TWh in 2015. The main energy resources came from coal, coke and electricity which resulted in total 14TWh of the energy coming from fossil fuels. Lastly the chemical industry total energy

³ The Final Energy Consumption is the sum of the final energy consumption by industry, transport, household, services, agriculture/forestry, fishing and other unspecified, excluding the energy to the energy transformation sector and to the energy industry.

consumption was 12 TWh in 2015, with 50% coming from electricity (Energimyndigheten 2017).

Environmental taxes

Eurostat provides data on environmental taxes in the EU member states and distinguish between taxes relating to energy, transport, pollution and resources. The total share of environmental taxes as a percentage of total revenues from taxes and social contributions (excluding imputed social contributions) in Sweden 2015 was 5.14%, in Finland 6.65% and in EU28 6.31%. Looking at energy taxes only (which also includes taxes on transport fuels), the percentage was 4.03% for Sweden, 4.53% for Finland and 4.83% for EU28 (Eurostat 2017b). In an European perspective, the total environmental taxes, as well as the energy taxes, in Sweden are low. Just three countries (Belgium, Germany and Luxembourg) in EU have lower environmental taxes than Sweden as a % of total revenues from taxes and social contributions (Eurostat 2017b)

Eurostat also provides information about the energy taxes by economic activity for 2014. For Sweden, the energy taxes paid by households represented the biggest share, closely followed by energy taxes paid by industry, construction and services (excluding transport and storage). To compare, the industry, construction and services stood for the greatest share of energy taxes in Finland (See Annex 1, figure 2) (Eurostat 2017b).

Norra Mellansverige

The report "State of The Nordic Region 2016" shows that the geographical area of Norra Mellansverige has potential for both biomass, wind power, hydropower and solar energy. The western part, consisting of Värmland has greatest potential for biomass and wind, while the eastern part has a greater potential for solar power and hydro power (See Annex 3) (Nordregio 2016).

Table 1 shows statistics on energy consumption and green gas emissions from the three regions Värmland, Dalarna and Gävleborg and Sweden. Where the information is missing, statistics have been difficult to find.

	Energy consumption/ inhabitant	Industry and building / total energy consumption	Green gas emissions ton/year	Green gas emissions from industry (energy+processes) ton/ year and percentage out of total green gas emission
Sweden	38 MWh (2016)	39% (2015)	-	-
Värmland	65 MWh (2013)	-	1 322 783 (2015)	246 408 (2015) = 18.6%
Dalarna	53 MWh (2014)	50% (2014)	1 819 308 (2015)	682 515 (2015)= 37.5%
Gävleborg	70 MWh (2014)	>50% (2014)	1 538 180 (2015)	325 755 (2015) = 21.2%

Table 1: Source: Miljömål.se (Naturvårdsverket), SMHI

What is clear from table 1 is that the energy consumption/ inhabitant is significantly higher for the three regions than for the nation as whole, due to the heavy industries. The green gas emissions from the industry as a percentage out of the total green gas emissions vary between the three regions. Especially Dalarna's number stands out.

The regional reports on energy balances show some differences between the three regions. However, bioenergy constitutes an important part of the industry's energy consumption. Also electricity from hydro energy is an important energy source for the industry. For more details about the regional energy balances, see Annex 4 (Länsstyrelerna 2015).

Värmland

46% of the energy in Värmland come from biofuels, 27% from fossil fuels and 27% from electricity. It is mainly the pulp and paper industries that uses biofuels (Länstyrelsen Värmland u.å.).

The share of renewable energies (excluding electricity and district heating) was significant higher for Värmland than for the nation as whole in 2011 (See Annex 5). However, one of the goals in Värmland's regional strategy "Värmlandsstrategin" is that the share of renewables of the total energy consumption shall increase (Region Värmland 2014). The forest based bioeconomy sector in Värmland is important and constitutes one of Värmland's smart specialisations. The bioenergy sector has more than 5000 employees (Kontigo 2018), and Karlstad University has a project about bioenergy under the research profile on forest bioeconomy. The project, with the name Research Environment for a sustainable forest based economy (FoSBE), aims to increase the knowledge about the future need for biomaterials and bioenergy (Karlstads universitet 2018)

Another of Värmland's smart specialisations is systemic solutions for solar power which requires competence in the different techniques and that private and public bodies are working to increase the share of renewable energies. In Värmland there are many energy companies successful in solar power and Karlstad University has a research project called Solar Värmland, which is driving research about solar cell material. Furthermore, Renewable Sun Energy in Glava is the only place in Sweden that produces solar panels. Glava also has a demonstration park for solar power, that works as a leading international test center for developing technology for renewable energies (Kontigo 2018).

Dalarna

Dalarna has a big share of renewable energy especially from hydro power and bio energy. Dalarna's strategy for environment and climate points out that in the short run there is a potential to increase the share of wind power and bio energy, and in a longer run also increase the share of solar power (Länsstyrelsen Dalarnas län 2012).

The share of wind power has increased the last couple of years and Tripple Steelix/Jernkontoret has established a center for wind power. The purpose of

the center is to create new jobs and businesses in the sector (Energiintelligent u.å.).

One of Dalarna's smart specialisations is how to build new societies in an energy efficient way. One of Högskolan Dalarna's research profiles is energy, forest and built environment (Energi, skog och bygd miljö). Furthermore, Högskolan Dalarna also has environments for collaboration and one of them is the centrum for energy competence (EKC), which gathers different actors within the research profile (Oxford research 2017).

One part of the research profile on Energy, forest and build environment is research and education about solar power. Högskolan Dalarna has a master's degree, as well as a Master of Science in solar power technology. The academy works together with the cluster High Voltage Valley and other actors in the business sector. The business sector in Dalarna is successful in energy efficiency and even though energy efficiency is a prioritized area at Högskolan Dalarna, the research in the area does not have a strong connection to the business sector and the technique required for electricity (Oxford research 2017a).

Gävleborg

In the 2008 Environment and climate strategy for Gävleborg, a goal was set to increase the use of renewable energy sources. Between 2008 and 2013 the share of renewable energy as a share of the total energy consumption increased from 62% to 68% (Länstyrelsen Gävleborg 2017a).

To continue the work, the report suggested to further develop the wind power sector. To furthermore increase the use of renewable energy in the industry sector, the industry and the small and medium sized enterprises should contribute to the transition from oil to biofuels (Länstyrelsen Gävleborg 2017a).

In 2017 Gävleborg got a financial support of more than 100 million from the Swedish state under the initiative "Klimatklivet". The support aimed to increase the local work on climate change and the company Setra Trävaror AB got 117 million to invest in production of bio based "pyrolysolja". The oil is produced from rest products from Kastets sawmill nearby. The prospects are that the "pyrolysolja" can replace 10 000 ton of heating oil and decrease the share of green gas emissions with 33 000 ton every year in 25 years (Länstyrelsen Gävleborg 2017b).

One of Gävleborg's smart specialisations is Technology for material and sustainable production. Högskolan Gävle has an area of research, Built environment (Byggd miljö), which among other things focuses on energy systems and how to develop a modern and innovative industry. Gävleborg has great knowledge in energy systems and energy efficiency. (Region Gävleborg 2017). Furthermore, Högskolan Gävle is also driving research about biofuels (Oxford Research 2017b).

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4 Workshop 4: Promoting entrepreneurship and mobilising the private sector

This material is aimed for the fourth workshop on the theme “Promoting entrepreneurship and mobilising the private sector” that seeks to address the questions:

- What can regions do to ensure that, in particular, young high-growth enterprises obtain necessary financing, and that investments are not hampered by overly strong regulations or red-tape? Which are the areas where national governments have a role to play, and which would be desirable policy changes?
- What is the best way to link the private sector with universities and research centres, to ensure that the innovation ecosystem is responsive to the needs of the private sector?
- What can regions do to facilitate successful and dynamic enterprises to scale up quickly? What are the main obstacles and areas that need to be focused on?

The material is based on the Regional Entrepreneurship and Development Index together with a range of national as well as regional statistics on entrepreneurship, startups, scale-ups and other indicators relevant for the topic.

Entrepreneurship

The Regional Entrepreneurship and Development Index describes the entrepreneurial process in the regions. The index is based on three cornerstones: entrepreneurial attitudes, abilities and aspirations. In 2013, Norra Mellansverige had a ranking of 36 of in total 125 regions and gets an index of 57.7. To compare with other regions in the EU see Annex 1, figure 1. Looking at specific indicators constituting the index, Norra Mellansveriges strengths were opportunity perception, risk perception, networking and financing. The weaknesses, on the other hand, were especially product innovation, process innovation and high growth. Furthermore, Norra Mellansverige rank low concerning competition, globalization technology absorption and start-up skills (European Commission 2013). To compare the indicators with the EU regional average and the region Wallonia, a region which is also participating in the pilot project, see Annex 1, Table 2.

In the report “Entreprenörskapsbarometern 2016”, Tillväxtverket shows that almost 1 out of 10 of the Swedish population in the age where you work are entrepreneurs (a person with entrepreneurship as their main occupation) (Tillväxtverket 2016). Looking at statistics from Statistiska Centralbyrån and Sysselsättningsregistret, it is clear that there are regional differences when counting for **self-employed (egenföretagare) as a total share of the employed**. The regions Värmland and Dalarna showed a rather high total percentage (10-11.9%) compared to the northern regions as well as the Stockholm region and Västra Götaland in Sweden. Gävleborg scored a bit lower with 9.5- 10% self-employed as a total share of the employed (See Annex 2).

When looking at the number of entrepreneurs (someone who is running his/her own company) as a share of the total population instead, there has been a decrease of entrepreneurs the last couple of years, both for Sweden but also for the individual regions. Table 1 shows the percentage of entrepreneurs as a share of the total population for the years 2010- 2016 in Sweden, Värmland, Dalarna and Gävleborg (Ekonomifakta u.å.).

	2010	2011	2012	2013	2014	2015	2016
Sweden	6.9 %	6.8%	6.7%	6.7%	6.6%	6.5%	6.3%
Värmland	6.3%	6.2%	6.1%	6.1%	6.1%	6.0%	5.7%
Dalarna	6.9%	6.7%	6.7%	6.6%	6.5%	6.4%	6.2%
Gävleborg	6.3%	6.3%	6.3%	6.1%	6.0%	5.9%	5.7%

Table 1: Ekonomifakta u.å.

Important to note is that when **looking at the numbers of entrepreneurial people, instead of just entrepreneurs, as a share of the total population** (16-74 years old) the numbers is a bit different. Svenskt Näringsliv count an entrepreneurial person a someone who either has a “F-skattedel”, is part owner in an active joint stock company (handelsbolag) or CEO or ordinary board member in a stock company. When using this definition, it shows an increase in entrepreneurial people the last couple of years for all three regions. In 2017, 10.7% of the population in Värmland were entrepreneurial and the same numbers for Dalarna were 11.6% and for Gävleborg 10.3%. However, it was lower than the Swedish average of 12.3%. Furthermore, the number of young entrepreneurial people were lower in the regions of Norra Mellansverige than the national average of 5.5%. In Värmland the number was 4.3%, for Dalarna 4.8% and for Gävleborg 4.3% (Svenskt Näringsliv 2018a; 2018b; 2018c).

Early staged companies

The Global Entrepreneurship Monitor (GEM) is doing an annual comparison on the entrepreneurial activity between different countries based on an activity index, Total Early-staged Entrepreneurial Activity, TEA. The index measures how many in the population between 18-64 are in the process of starting a company, or how many who have already started a company that has not been running for more than 48 months. Sweden scored relative low, with a percentage of 7.3 and a rank of 44 out of in total 54 countries in 2017 (Ekonomifakta 2018).

The number of startups has been stable in Norra mellansverige the last couple of years. See table 2.

	2013	2014	2015	2016	2017
Sweden	69 242	71 688	70 135	71 825	68 887
Värmland	1430	1527	1457	1484	1424
Dalarna	1449	1587	1576	1607	1606
Gävleborg	1549	1485	1500	1577	1476
Norra Mellansverige	4 428	4599	4 533	4 668	4 506

Table 2: Tillväxtanalys 2018

Looking at the number of startups per 1000 inhabitants (16-64 years old) there was a rise up to 2011 in Sweden and in the individual regions, and after that it has evened out. While the Swedish average number of startups per 1000 inhabitants for 2016 was 11, Värmland had 9, Dalarna 9.7 and Gävleborg 9.4. The number of startups per 1000 inhabitants is lower in Norra Mellansverige than the average for Sweden (see Annex 3) (Ekonomifakta u.å.).

The last couple of years there has been a decrease in startups among young people (18-25 years old). In Sweden the decrease was 8 % between 2016 to 2017 (Visma 2018). In Värmland there was a 19.9% decrease between 2016-2017 (NWT 2018). Among young people (18-25 years) most companies in Värmland were started in the forest management sector in 2017. In Dalarna and Gävleborg most companies were started in the beauty sector (Visma 2018).

Looking at attitudes there are some differences among the regions. Entreprenörskapsbarometern measures the attitudes towards starting a business. In Värmland 44 % of the population could imagine becoming an entrepreneur, while the same number is 43% for Dalarna and 39% in Gävleborg. **The average for the whole country was 47%, showing that the population in Norra Mellansverige can less than the average population in Sweden imagine becoming an entrepreneur.** Entreprenörskapsbarometern is also looking into how many, out of the people who could imagine becoming an entrepreneur, would choose to be an entrepreneur above being employed or combine both entrepreneurship and being employed. In Värmland 33 % prefer just being an entrepreneur, while the same numbers are 38% in Dalarna and 22% in Gävleborg. The Swedish average is 32% (Tillväxtverket 2016).

Scale-ups

Almi is scoring the fastest growing companies in different Swedish regions. Some of the requirements are companies with a minimum of 5 employees, a minimum turnover of 5 million Swedish crowns and a positive economic result. In Värmland the fastest growing company in 2016 was CWT worktools AB, with an increase in turnover with 246% in 2015. Closely followed was Visaren AB, a consultancy in PR. For the geographic area including both Dalarna and Gävleborg, the biggest company was Swedish Conveying Technology Hiss AB, with an increase in turnover with more than 250% in 2015. The company is focused on elevators. The second fastest growing company was AM Berglund AB, which is focused on cleaning (Almi 2016).

Survival rate

Of the people registered as entrepreneurs, 65.2% were still active five years later in Värmland 2017. The same number was 63.3% in Dalarna and 61% in Gävleborg. With a Swedish average survival rate at 61.3 %, Värmland and Dalarna showed a higher survival rate than the Swedish average (Svenskt Näringsliv 2018a; 2018b; 2018c).

Generation shift

The regions of Norra Mellansverige had a high number of older people (older than 64 years) counting as entrepreneurial in 2017. The percentage of older

people was 22.3% in Värmland, 22.1 % in Dalarna and 20.8% in Gävleborg. The average in Sweden was 18.9% (Svenskt Näringsliv 2018a; 2018b; 2018c). The high share of older entrepreneurial people led to a project in Dalarna called “Center for shift in ownership”. The project was to begin with managed by Falun Borlänge-regionen but was carried on by Almi. The center provides support and consultation to create better circumstances for the SMEs that are undergoing a shift in generation and ownership (Almi u.å.).

Finance

In 2017 the Commission presented the analytical report “Surveys on the access to finance of enterprises” (SAFE). The report looks into different financial options among SMEs in European countries. What stands out is Sweden’s high share of equity capital among SMEs. The result shows that 16% of participated enterprises responded that they had used equity capital the last six months, which is way ahead of Malta with the second highest, 4 %, share of equity capital used the past 6 months (see Annex 4). Furthermore, Sweden had a higher share of SMEs responding that they have used leasing or hire-purchase and factoring in the past 6 months compared to the EU28 average (European Commission 2017). On the other hand, Sweden had a lower share of SMEs responding that they had used credit line, bank overdraft or credit cards overdraft, bank loans, trade credit, grants or subsidized bank loans, retained earnings or sale of assets and other loans in the past 6 months compared to the EU28 average (European Commission 2017).

Finally, when looking at the share of external finance the results shows that Sweden, together with the Netherlands, were in the top when counting for the size of the bank loan the enterprises obtained or renegotiated the past 6 months (more than 1 000 000 euro) (European Commission 2017).

Mikaela Backman, doctor in economics at the international school of business in Jönköping, shows that lack of finance is a problem in the rural areas in Sweden due to that the banks are mainly located in the cities, as Stockholm and Gothenburg. She also shows that especially Värmland has less banks than expected. A local competition in the bank sector is for that reason more crucial for the rural areas, to enable finance for startups (Entreprenörskapsforum u.å.).

The Nordic Region 2018 shows that the Foreign Direct Investments (FDI) has decreased in Värmland and Dalarna, while it has increased in Gävleborg between 2003-2016. The FDI intensity was on the other hand a bit higher in Dalarna (250-500 million euros), than in Värmland and Gävleborg (100-250 million euros) between 2003-2016 (State of the Nordic Region 2018) (see Annex 5).

Collaboration with academia and educational sectors

In an international perspective, Sweden scores high when looking at the percentage of the population who have tertiary education (Eurostat 2016). Värmland, Dalarna and Gävleborg, however, show a smaller share of the population with higher education than the national average. In Kontigós “innovation index” the indicator “education level” is transformed into an index, where 100, represents the national average. The index measures education level as at least 3 years of education after high school. Compared

to the Swedish average of 100, Värmland scored 77.76, Dalarna 70.53 and Gävleborg 69.32 (Kontigo 2016; Reglab 2017a; Reglab 2017b).

A report from Svenskt Näringsliv concerning the future entrepreneurship in Värmland shows that the enterprises in Värmland graded the collaboration with vocational education and high school as best functioning in 2014. The enterprises, represented by a panel of enterprises from Värmland, did not think that the collaboration with the universities and the elementary school reached the same level. However, to reach competitiveness the panel of enterprises responded that the vocational education and high schools were the most important actors to collaborate with, closely followed by the universities/academy (Svensk Näringsliv 2014).

Another indicator in Kontigos “innovation index” is *Ung Företagsamhets utbildningskoncept*. The indicator is transformed into an index, where 100 represents the national average. In 2017, Värmland scored 150, Dalarna 85 and Gävleborg 125. The result shows that more high school students in Värmland and Gävleborg were participating in *Ung Företagsamhets utbildningskoncept* than the Swedish average in 2017. For Dalarna, on the other hand, it was the opposite (Kontigo 2016; Reglab 2017a; Reglab 2017b).

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5 Workshop 5: Inclusive growth

This material is aimed for fifth workshop on the theme “Inclusive growth” that seeks to address the questions:

- How can we ensure that the processes of transformation of regional labour markets and economic activities lead to less rather than more social exclusion in industrial transition regions? Which are the policies that can be undertaken at regional level, and which need to be undertaken at national level?
- How can broad-based innovation improve the wage and employment prospects of workers in traditional firms and those with low productivity in general (given the link between productivity and wages)?
- The energy transition has strong distributional effects, how do we ensure that the process is fair, for workers and consumers?
- Entrepreneurship can be a strong force for opportunity and social mobility. How can we make sure that this is the case, rather than creating opportunities for a few?

This material is based on the Gender Equality Index as well as regional statistic from mainly Statistiska centralbyrån (SCB) and Eurostat on employment, unemployment and entrepreneurship. Some of the statistics are limited to national level, while other statistics are provided at NUTS3 or NUTS2 level. Furthermore, regional reports on Värmland, Dalarna and Gävleborg have been used to get a better understanding on the current situation in each region.

Gender Equality Index

With an index of 82.6, Sweden scored as the highest country in the Gender Equality Index in 2015. The EU average was 62.2. Sweden was the top country when looking at indicators as domain of work, which measures the access to employment and good working conditions. Furthermore, Sweden came on the third place when counting for domain of money, which measures gender inequalities in financial resources. The indicator focuses on gender gaps in monthly income as well as comparing the economic situation among men and women when counting for poverty and income distribution. Sweden also scored high for indicators such as gender equality in education, decision-making and health (European Commission 2017a).

Education

Women and men

In 2015, 54 % of the women and 40 % of the men in the ages 25-44 had higher education (an education level higher than high school) in Sweden.⁴ When looking at the ages 45-64, 40% of the women had higher education and 33%

⁴ In the report ”Aha! Det du kanske inte visste om jämställdhet i Värmland” from Länsstyrelsen Värmland och Region Värmland (2016) the numbers on the percentage of the population with higher education look different. There it shows that the percentage of the population aged 25-44 with a higher education was 49% for women and 34% for men in 2015.

of the men. For more detailed information about the population in Sweden divided into different education levels, see Annex1 (Statistiska centralbyrån 2016)

However, there are regional differences. In Värmland the share of people in the ages 25-44 who had higher education was 40% among women and 20 % among men in 2015. In the ages 45-64 the same numbers were 24 % for women and 14 % for men (Länsstyrelsen Värmland & Region Värmland 2016).

In Dalarna 13.5 % of the women had less than 3 years of education at a higher level than high school, while 19.5% of the women had more than 3 years of education at a higher level than high school. The same numbers for the men in the region was 11.7 % and 11 % (Region Dalarna, u.å.).

In Gävleborg 2012, the share of the population in the ages 16-64 who had an education level higher than high school was 36.5 % for women and 23.5 % for men (Länsstyrelsen Gävleborg 2014).

Even though the statistics varies between the 3 different regions there seem to be a trend that the difference between the education level for men and women is bigger in the regions of Norra Mellansverige than the difference for the whole country. As an example, while the number of percentage points between men and women in Sweden were 14, the number of percentage points in Värmland were 20 in 2015 (refers to the ages 25-44).

Foreign born

When looking at the education level for foreign born compared to people born in Sweden in the ages 16-64 in 2017, the greatest difference is between those who have a high school degree and those who do not. 46.6% of the people born in Sweden had an education level up to high school, while the same numbers for foreign born were 32.0%. When looking at the share of the population who had a higher education level than high school the difference is smaller. 38.3% of the people who were born in Sweden had a higher education level higher than high school, while the same numbers for foreign born were 36.4%. Worth noting however is that 9.8% of the information on foreign born is missing (Ekonomifakta 2018a).

Employment

Women and men

The percentage of employment (sysselsättning) as a total share of the population in the ages 20-64 is presented below in table 1. With an employment of 81.8 % out of the population, Sweden had the highest degree of employment in EU28 in 2016. For the regions of Norra Mellansverige, the total share of the employment is lower than the Swedish average. However, for Dalarna and Gävleborg a higher percentage of women are employed than the average for Sweden.

	Women	Men	Total
EU28 + Norway	65.3%	76.9%	71.1%

Sweden (Eurostat)	79.2%	83.0%	81.2 %
Germany	74.5%	82.7%	78.6%
Sweden (SCB)	79.8	83.8%	81.8%
Värmland	78.3%	82.9%	80.7%
Dalarna	80.7%	80.4%	80.6%
Gävleborg	80.3%	82.4%	81.4%

Table 1: Akademikernas A-kassa 2018, based on statistics from Eurostat and SCB.⁵

Eurostat provides data on gender gap in part-time employment in 2014. The statistics show a difference between 10 to 20 percentage of the share of women and men working part time in the ages 15-64 in Sweden. (See Annex 2) (Eurostat 2015a). Furthermore, statistics from Akademikernas A-kassa shows that 80% of the employed in Sweden worked full time (35 hours and more) in 2017. However, there were some differences between the sexes, where 28 % of the women and 11 % of the men in the ages 20-64 years worked part time (Akademikernas A-kassa 2018).

There is a big different between women and men when looking at type of branch of industry. Women tend to work in the care and education sector, while men work in building, transport and construction sectors etc. (Statistiska centralbyrån 2018).

In Värmland in 2014, the top 3 professions among women were enrolled nurses (undersköterska) (11%), teachers at elementary school, nursery school or after school teacher (9%) and shop assistance (7%). For men, on the other hand the top 3 professions were carpenter, bricklayers or construction worker (5%), truck and bus driver (4%) or vehicle mechanic and repairer (4%) (Länsstyrelsen Värmland och Region Värmland 2016).

Age differences

To see the employment rate in different ages, see Annex 3. The age group of 45-54 years has the highest employment rate in Sweden, with a total employment rate of 88.6% (Ekonomifakta 2018b)

Foreign born

The Swedish employment have increased with 9 % the last 10 years, mainly due to the increase in the employment among foreign born. Between 2016 and 2017 there was an increase in employment with 87 000 people. Out of those 87 000, almost 80 % were born in another country (Akademikernas A-kassa 2018).

Even though the employment rate has increased for both people born in Sweden and foreign born the last couple of years, the difference between the two groups have not disappeared. The gap in employment between foreign born and born in Sweden in the ages 20-64 was very high compared to other

⁵ SCB counts an employed as someone who is in the age 16-64, has worked at least an hour under a reference week, or a person who has a job which he/she was absent from (SCB 2014). Eurostat counts employment as a person who is 15 years and older and have worked during the reference week, even just for an hour, both for pay, profit or for family gain. The person could also have a job, which whom were absent from due to sickness or other temporarily reason. (Eurostat 2015b)

countries in 2017. The difference in percentage points was for Sweden 15.8. The only country with a bigger gap in Europe was the Netherlands, with 16.4 percentage points (Ekonomifakta 2018c).

Annex 4, figure 4 shows that there is bigger division in employment between women and men among foreign born, than between women and men among people born in Sweden. Due to the fact that Sweden has a high employment rate among women born in Sweden compared to other countries, the statistics show a great difference between foreign born women and women born in Sweden (Migrationsinfo 2017).

Lastly, there is a big difference in the number of people who work (förvärvsarbete) depending on birth place. To see full charts for Värmland, Dalarna and Gävleborg, see Annex 4 figures 5,6 and 7. For all 3 regions, less than 50 % of the people born outside the EU were working in 2014. For Gävleborg, not even 35 % of the people born outside the EU were working (Migrationsinfo u.å.).

Unemployment

Women and men

Looking at the unemployment rate in the ages 20-64, the countries Poland, Rumania, Denmark, the Netherlands, Hungary, Great Britain, Norway and Germany had a lower unemployment rate than Sweden according to data from Eurostat.

	Women	Men	Total
EU28 + Norway	8.6%	8.2%	8.4%
Sweden (Eurostat)	5.8%	6.7%	6.3%
Germany	3.7%	4.5%	4.1%
Sweden (SCB)	5.6%	6.3%	6.0%
Värmland	5.9%	5.0%	5.4%
Dalarna	4.9%	8.2%	6.6%
Gävleborg	5.8%	6.4%	6.1%

Table 2: Akademikernas A-kassa 2018, based on statistics from Eurostat and SCB.⁶

Annex 5, figure 8 shows the change in unemployment rate in the ages 15-74 in Värmland, Dalarna and Gävleborg for the period of 2005-2017. The overall picture is that unemployment has decreased in all regions, except for Dalarna the last couple of year. Especially the unemployment rate among men in Dalarna stands out, since it has increased between 2016-2017 (See Annex 5, figure 9) (Tillväxtverket 2018).

⁶ SCB counts an unemployed person as someone who is in the age 16-64, has no job, is able to take a job, have actively been looking for jobs, or as someone who have a job starting in 3 months (SCB 2014). Eurostat counts an unemployed person as someone who is without work during the reference week, who is available to start a job the next 2 weeks, have a job starting within the next three months or someone who have actively been looking for jobs the last 4 weeks (Eurostat 2010).

Young people

The youth unemployment, included people who are studying fulltime and actively looking for a job, was 17.8% in the ages 15-24 in Sweden 2017. A better way to measure youth unemployment is to count the people who are neither studying or working. According to SCB, in 2017, 6.2 % of the population was neither studying or working. 49 % of them were women and 51 % were men (Akademikernas A-kassa 2018).

Looking at the statistics from Eurostat, that measures youth unemployment as NEET (youth not in employment, education or training), the youth unemployment statistics for EU28 + Norway for 2016 was 11.5%, for Sweden 6.5% and to compare, for Germany 6.7% (Akademikernas A-kassa 2018).

Eurostat also provides youth unemployment⁷ (all unemployed accounted) statistics at NUTS2 level for 2017. Table 3 shows the EU28 youth unemployment rate for people in the ages 15-29 the last 5 years, together with the rate for Norra Mellansverige and some of the regions participating in the pilot project on industrial transition.

	2013	2014	2015	2016	2017
EU average (current composition)	19.0%	17.7%	16.2%	14.7%	13.2%
Norra Mellansverige	20.2%	18.8%	16.7%	16.9%	15.1%
Saxony	9.6%	9.4%	8.3%	6.8%	6.5%
Wallonia	23.1%	23.8%	23.4%	19.9%	20.6%

Table 3: Eurostat 2018a

Entrepreneurship

Women and men

The share of self-employed people is very low in Sweden compared to other EU countries. Data on self-employment rate as a share of the total population (in the ages 15-64) shows that Sweden had a low number of self-employed women, with just around 5 % of the women being self-employed in 2015. That is the second lowest rate in EU after Denmark. The average for EU28 was 9.9 %. Even though the share of self-employed men is also low for Sweden, the countries Denmark, Estonia, Germany and Luxembourg are at the same level or below Sweden (OECD/EU 2017).

In Sweden 2016, women stood for 32% of the startups and men for 66% (Tillväxtanalys 2017).

Svenskt Näringsliv count an entrepreneurial person as someone who either has a "F-skattesedel", is part owner in an active joint stock company (handelsbolag) or CEO or ordinary board member in a stock company. The percentage of entrepreneurial women as a share of the population was for

⁷ Eurostat counts all young people who stand outside the labor market, even if they have another occupation (Eurostat 2014).

Sweden 7.7% in 2017. The same number for Värmland was 6.2%, for Dalarna 7.0% and for Gävleborg 5.9% (Svenskt Näringsliv 2018a; 2018b; 2018c).

Svenskt Näringsliv counts a newly entrepreneurial person as someone who counts as an entrepreneurial person the occurring year but did not count as an entrepreneurial person last year. The number of newly entrepreneurial among women were 7.9 per 1000 inhabitants in 2017 for Sweden. The same number in Värmland was 5.6, in Dalarna 6.6 and in Gävleborg 6.1. The regions of Norra Mellansverige scored relative low when looking at the number of newly entrepreneurial people among women, especially Värmland stands out as the second lowest region in Sweden. There has been a decrease in newly entrepreneurial women from 6.1 per 1000 inhabitants in 2007 to 5.6 per 1000 inhabitants in 2017 in Värmland (Svenskt Näringsliv 2018a; 2018b; 2018c).

Young people

The percentage of self-employed as a share of the total number of employed in the ages 15-29 in 2013 shows that Sweden is ranked low compared to other European countries. The numbers show that not even 4% of the young people in Sweden were self-employed while the average for EU28 was 6.5% in 2013 (European Foundation for the Improvement of Living and Working Conditions 2015).

Looking at the percentage of young entrepreneurial people as a share of the population, the regions of Norra Mellansverige scored lower than the national average of 5.5%. In Värmland the number was 4.3%, in Dalarna 4.8% and in Gävleborg 4.3% (Svenskt Näringsliv 2018a; 2018b; 2018c).

The number of newly entrepreneurial among young people (in the ages 16-34) per 1000 inhabitants in 2017 were 11.8 for Sweden. For Värmland it was 10.3, for Dalarna 9.9 and for Gävleborg 9.4 per 1000 inhabitants (Svenskt Näringsliv 2018a; 2018b; 2018c).

Foreign born

The statistics on foreign born entrepreneurs shows that foreign born women are entrepreneurs in a higher degree than women born in Sweden. 5.2% of the women born in Sweden and 5.4% of the foreign-born women in the ages 16-64 were entrepreneurs in 2017. For the men the numbers are the other way around; 12.1% of the men born in Sweden and 11.3% of the foreign-born men were entrepreneurs in 2017 (Ekonomifakta 2018d).

Income

The unadjusted gender pay gap in Sweden was 13.3 % in 2016, while the average unadjusted gender pay gap in EU28 was 16.2%. The EU countries Belgium, Greece, Croatia, Italy, Luxembourg, Malta, Poland, Romania and Slovenia had a lower gender pay gap compared to Sweden in 2016 (Eurostat 2018b)

Table 3 shows the income of households in euro per inhabitant between the years 2012-2016 (Eurostat 2018c).

	2011	2012	2013	2014	2015
Norra Mellansverige	21.100.00	22.300.00	22.700.00	22.600.00	22.400.00
Saxony	17.300.00	17.800.00	18.100.00	18.400.00	19.000.00
Wallonia	20.500.99	20.800.00	20.900.00	21.000.00	-

Table 3: Eurostat 2018c

Statistics from SCB shows that the average yearly income was lower in Värmland than the average yearly income in Sweden. For women in 2014, the average income was 244 000 in Värmland and 264 000 in Sweden. For men the average income was 297 000 in Värmland and 338 000 in Sweden (Länsstyrelsen Värmland och Region Värmland 2016).

Table 4 shows people at risk of poverty or social exclusion as a percentage of the total population. Due to the fact that statistics from Wallonia and Saxony are missing, statistics on Sweden and the region Piemonte (which is also participating in the pilot project on industrial transition) are shown as a comparison instead.

	2012	2013	2014	2015	2016
Sweden	17.8%	18.3%	18.2%	18.6%	18.3%
Norra Mellansverige	19.2%	19.8%	21.3%	18.5%	15.5%
Piemonte	20.3%	16.5%	18.8%	18.0%	22.9%

Table 4: Eurostat 2016

Equality in the regional smart specialization strategies

Värmland was the first European region to adapt a gender approach to their smart specialization strategy. Dalarna and Gävleborg have also taken steps in the direction to further integrate a gender approach (European Commission 2017b).

Värmland's smart specialization strategy acknowledge the segregated labour market and promotes gender inclusion to boost growth. The strengths in the strategy have been drawn up based on a gender equality perspective, so called "gender mainstreaming", which means that the strategy indicates the consequences of the priorities for both men and women (Region Värmland 2015). Also Dalarna's smart specialization strategy has a gender approach, by pointing out gender equality as an important role in being an innovative region. Furthermore, the strategy highlights the clusters as an important tool to reach gender equality (Region Dalarna 2015).

Gävleborg is working to increase the importance of a gender approach in the innovation supporting system. By a project called "Öppna upp-konceptet", the Region together with Tillväxtverket and Rise/Acero are working to increase the knowledge about regional growth through a gender perspective. The purpose is to tie the project together with the smart specialization strategy. Furthermore, one of the strengths in Gävleborg's current smart specialization strategy is sustainable and inclusive work life. Gävleborg is driving research

on how to reach a sustainable work life and how to increase equality (Region Gävleborg 2017).

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