Just Transition on Gotland, Sweden

Labour market consequences of the green transition – Final report

Regional and Urban Policy

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Introduction

This report contains an analysis of the expected labour market impacts from the green transition of the cement and mineral industry on Gotland. The purpose of the report is to provide an overview of the changes that the green transition may mean for Region Gotland and what challenges and opportunities this transition may entail. The report addresses the demands for labour and skills resulting of investments in the industry and energy sector and the actions needed to ensure that the skills are available.

The report is developed for Region Gotland, Sweden, under the JTP Groundwork Technical Assistance in the period from May 2024 to January 2025. A number of stakeholders contributed to the analysis inter alia: Gotland County administrative board, Gotlands Elnät AB, Heidelberg Materials Cement Sverige AB, Uppsala University Campus Gotland and many more.

The analysis is based on a number of sources including official national and regional statistics and analysis, extensive literature review, stakeholder and expert interviews. The data collection took place from June 2024 to December 2025. The draft findings were presented to the stakeholders on Gotland during a workshop on November 8, 2024 in Visby. The reactions from the workshops were used to update and finalise this report.

Summary

In the coming years, Region Gotland needs to move towards a sustainable cement and mineral industry. Reduction of CO2 emissions from production at Heidelberg Materials in Slite and Nordkalk in Storugns on Gotland is at the core of the green transition of the industry. The two companies plan to make large investments in their production facilities and production of green fuels, with the aim of transforming mineral and cement production into a sustainable industry. These investments are supported through the Just Transition Fund.

The transition in the cement and mineral industry must be followed by extensive investments in green energy supply and modern energy infrastructure on and around Gotland. Therefore, feasibility studies have been carried out for a number of offshore wind farms near Gotland, and an upgrade of the electricity grid on Gotland as well as a new high-capacity power connection to the mainland is planned. However, there is uncertainty around the future of energy production, specifically offshore windfarms. On November 4, 2024, the Swedish government rejected 13 applications for offshore wind farms in the Baltic Sea that were under planning. Several of these were planned in the waters around Gotland.

The total extent of the investments in industrial transition and energy production is not known and most of the projects are in an early development phase. Furthermore, it is unlikely all planned projects will be implemented, emphasized by the Swedish government's rejection of applications offshore wind project. The potential for green jobs (including the investment for renewable energy) in the short-term could amount to up to 2,500 – 3,000 jobs (FTE's) until 2032 and between 1,000 – 1,500 jobs on a permanent basis. Future green jobs will be in the building and construction industry, maintenance, transport and logistics, industry and production and hotel and restaurants.

Region Gotland has seen a positive development in employment over the last ten years and unemployment is lower than in the rest of Sweden. In some industries (healthcare, education, construction, industry and production, restaurants and food, agriculture, etc.) there is a risk of a shortage of qualified labour in the longer term.

The green transition will create new opportunities for development on Gotland, and this development will place additional demands on the local labour market. As an island, the labour market has some special circumstances. The workforce must, generally, be resident on the island, as commuting (on a daily basis) is not realistic, due to travel time and costs.

Thus, the green transition has both opportunities and challenges for Gotland. This analysis outlines possible initiatives to address these, including:

- The key stakeholders on Gotland should formulate a common strategy for local involvement in the upcoming projects within the green transition. The strategy should prioritize the local efforts in relation to pursuing the relevant opportunities.
- The many possible renewable energy projects on and around Gotland calls for a systematic monitoring of the projects. The monitoring should help provide an overview of the development of projects, the likelihood that the project will be implemented and the positive and/or negative consequences.

- There is a need to establish a systemic dialogue with the owners/operators of the future green transition projects to align information about the plans, the resulting jobs, and the needed skills.

- The green transition will require new skills in the labour market. An even closer dialogue must be established with educational institutions and further development of educational and vocational opportunities to ensure relevant competences.

- Population development and the possibilities for relocation to Gotland is a prerequisite for attracting labour to the island. There is a need to remove barriers to relocation, including a possible housing shortage.

On November 8, 2024, a JTP Workshop was held on Gotland to discuss the draft finding of the present analysis. A major topic at the workshop was the question of Gotland's attractiveness, in relation to attracting skilled labour to Gotland. At the workshop there was widespread recognition that positive development for Gotland depends on more inhabitants and a larger workforce. This is a challenge that Region Gotland has in common with many other regions, both in Sweden and in the rest of Europe.

Region Gotland has therefore also initiated actions that addresses these challenges. The efforts focus on developing attractive living environment, an inclusive labour market, competitiveness and growth in business, high education level and good conditions for lifelong learning, renewable energy and good accessibility and sustainable communications.

1 Developments in the labour market on Gotland

1.1 Historic development of the labour market on Gotland

The labour market on Gotland is characterized by its small size and relative isolation, primarily due to the distance from the mainland. With a minimum sailing time of three hours to the mainland, this labour market is reliant on the local population, the available workforce, and the jobs created locally. Consequently, Gotland must adapt to changing trends within its own labour market.

At the beginning of the 2000s, Gotland encountered several setbacks affecting the local labour market, most of which the island has since overcome. In 2005, the electronics factory Flextronics ceased operations on Gotland, relocating production to other facilities, primarily abroad. The factory was originally owned by LM Ericsson, and when Flextronics acquired it in 1999, it employed approximately 950 people.

The Swedish Armed Forces have also had a significant impact on the labour market in Gotland. Historically, the Armed Forces maintained a strong presence on the island. However, around the turn of the millennium, their presence was considerably reduced, with the last permanent units closing in 2005. In 2016, military units were again stationed on the island, and in 2018, the Gotland Regiment was re-established as a permanent unit.

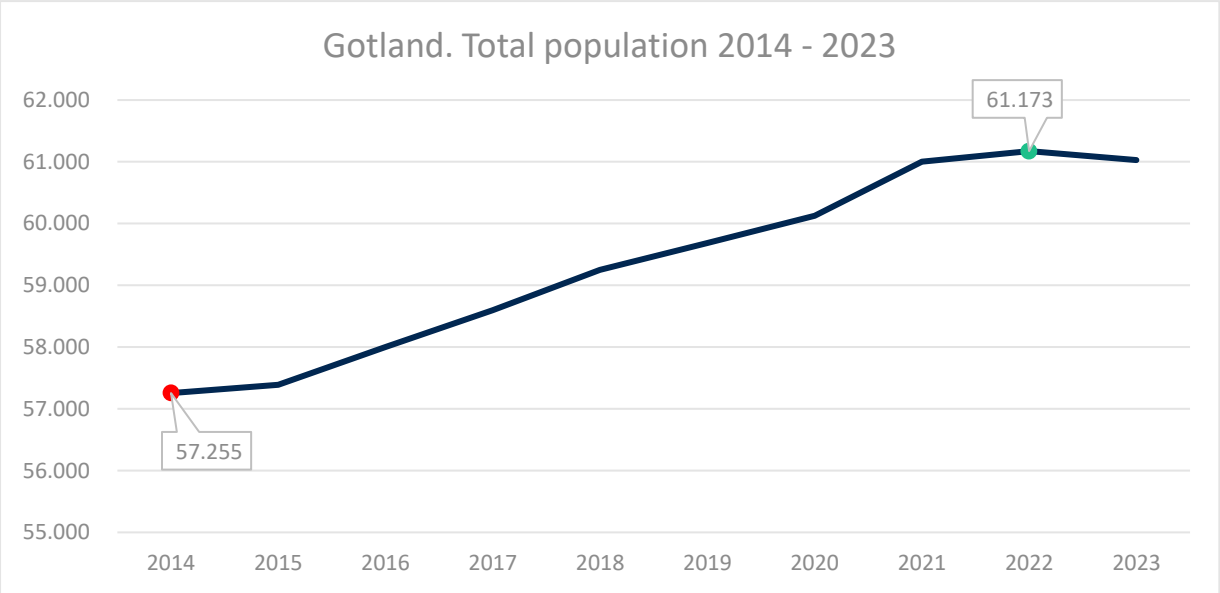
The developments in the early 2000s had varying effects on individuals who lost their jobs. Some opted for retirement, others found employment in different industries, while a number of people chose to leave the island in search of work elsewhere in Sweden.

The decline in jobs prompted the Swedish State to seek compensation for this development by establishing several state institutions and, consequently, jobs on Gotland, such as the Swedish National Heritage Board, the Swedish Social Insurance Agency, and the Swedish Tax Agency.

1.2 The demographic development on Gotland

The population on Gotland has been increasing in the period 2014-2022 (see Figure 1). Where in 2014,57,255 inhabitants lived on Gotland, the number in 2023 was 61,029 inhabitants. From 2022 till 2023, however, there has been a slight decrease.

Figure 1: Population on Gotland, 2014 – 2023.



Source: Statistics Sweden

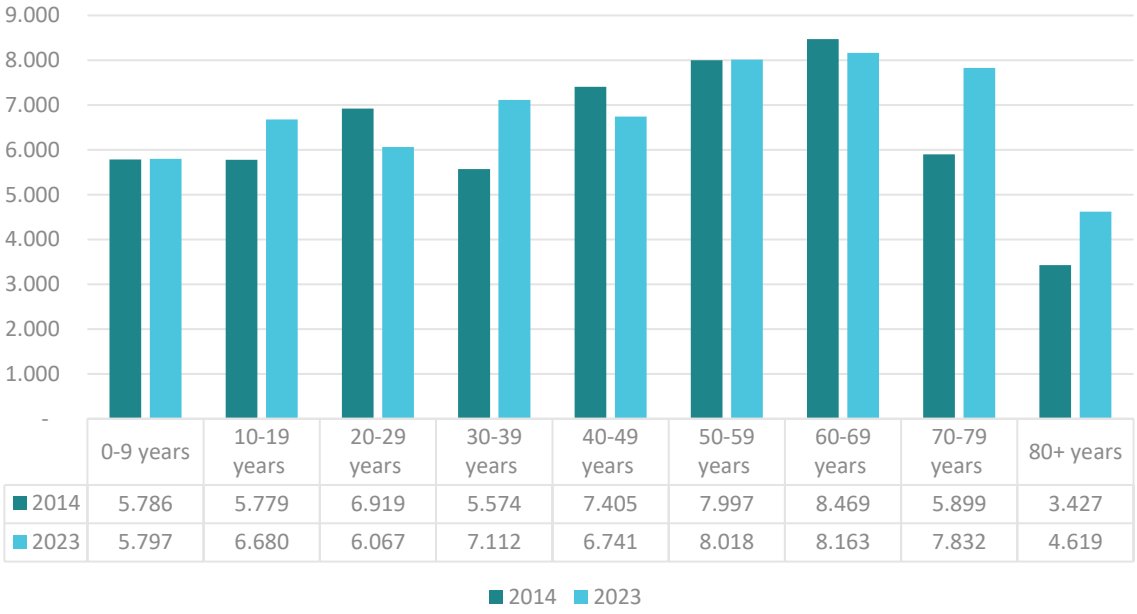
1.2.1 The population distributed by age

The population on Gotland has developed differently across the different age groups. Figure 2 shows the demographic composition of the years 2014 and 2023, taking into account different age groups (10-year intervals). The changes in population size and structure across various age cohorts, shows the demographic shifts on Gotland.

The young population (0-19 years) has slightly increased over the past 10 years. However, the number of young adults at university and early career (20-29 years), has experienced a decrease of almost 900 people (13%) in the period from 2014 to 2023. In contrast, there has been a significant increase in the working age group (30-39 years), with a 27% increase in population over the past 10 years. Despite a small decrease in the group of 40-49 years, in general this group has remained stable. The largest increase in population has been in the group of 70+ years. This group has grown with 33% of the population in the period between 2014-2023.

The overall working-age population, between 20 and 69 years, has decreased by roughly 200 people from 2014 to 2023.

Figure 2 Population in Gotland by age group, 2014 and 2023



	0-9 years	10-19 years	20-29 years	30-39 years	40-49 years	50-59 years	60-69 years	70-79 years	80+ years
2014	5.786	5.779	6.919	5.574	7.405	7.997	8.469	5.899	3.427
2023	5.797	6.680	6.067	7.112	6.741	8.018	8.163	7.832	4.619

Source: Statistics Sweden

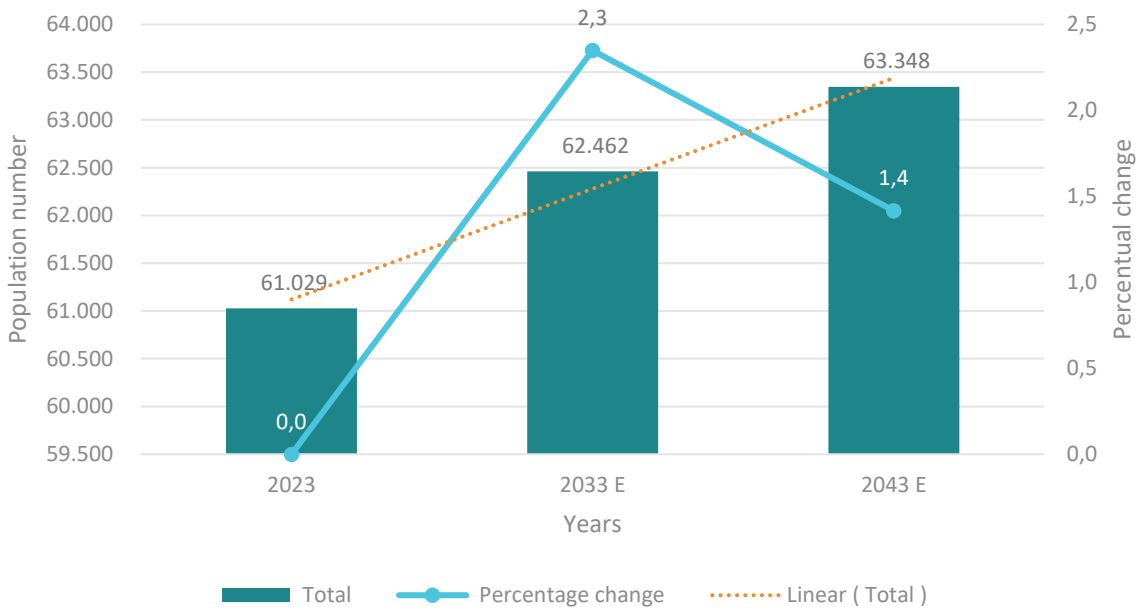
1.2.2 Population projection

The total population of Gotland is forecasted to experience a slight increase over the next decades. However, there are concerns with regard to the demographic development in the longer term, and whether the official forecasts for the population development are realistic. The fertility rate may in the longer term be lower than the forecasts. In this case, this will imply a more limited growth in the population in Sweden in general, as well as on Gotland[1].

According to the forecasts of Statistics Sweden (Figure 3), it is expected that by 2033, Gotland will be able to add around 1,400 people to its population, a 2.3 percent growth over 10 years. The following decade (until 2044) is expected to have a smaller increase, with a little under 900 people, a 1.4 percent increase from the preceding decade.

[1] https://www.scb.se/hitta-statistik/statistik-efter-amne/befolkning/befolkningsframskrivningar/befolkningsframskrivningar/pong/statistiknyhet/sveriges-framtida-befolkning-2024-2070/ and https://www.scb.se/en/finding-statistics/statistics-by-subject-area/population/population-projections/population-projections/pong/tables-and-graphs/children-per-woman-by-country-of-birth-19702022-and-projection-20232070/

Figure 3 Gotland's population projection for the years 2033 and 2043



Source: Statistics Sweden

The population of young people (0-19 years) is expected to decrease in the next decades, due to a forecasted lower number of people in the parent-age group (30-39 years) in the coming decades, as well as a decreasing fertility rate. The number of young adults (20-29 years) is expected to have a slight decrease in the period between 2023 and 2033, stabilizing in the following decade.

The age groups of 40 to 49 years, and 50 to 59 years, which both are relevant for the workforce, are expected to increase in the periods till 2023 and 2043, although with different trajectories. The 40 to 49 age group is projected to experience a substantial increase between 2023 and 2033, followed by a decrease by 2043, although the age group is still expected to be at a higher level than the current one. In contrast, the age group 50 to 59 is anticipated to see a decline between 2023 and 2033, but then experience a substantial surge in numbers during the subsequent decade (corresponding to the jump observed in the 40 to 49 years age group), resulting in a higher population level than the current one.

In sum, taking in consideration all age groups relevant to the workforce, from 20 to 69 years, although there are some variations in projected development trends between the age groups clustered in 10-year periods, the overall active labour force is expected to be stable. The elderly age group is expected to experience a very high increase in population, especially in the 80+ group, which expects to grow 37 percent between 2023 and 2043, i.e. an estimate of nearly 3,000 more persons.

Figure 4 Gotland's population projection by age group

	0-9 years	10-19 years	20-29 years	30-39 years	40-49 years	50-59 years	60-69 years	70-79 years	80+ years
2023	5.797	6.680	6.067	7.112	6.741	8.018	8.163	7.832	4.619
2033 E	4.988	6.662	6.546	6.236	8.159	7.131	8.419	7.626	6.696
2043 E	5.554	5.842	6.501	6.859	7.180	8.523	7.482	8.058	7.349

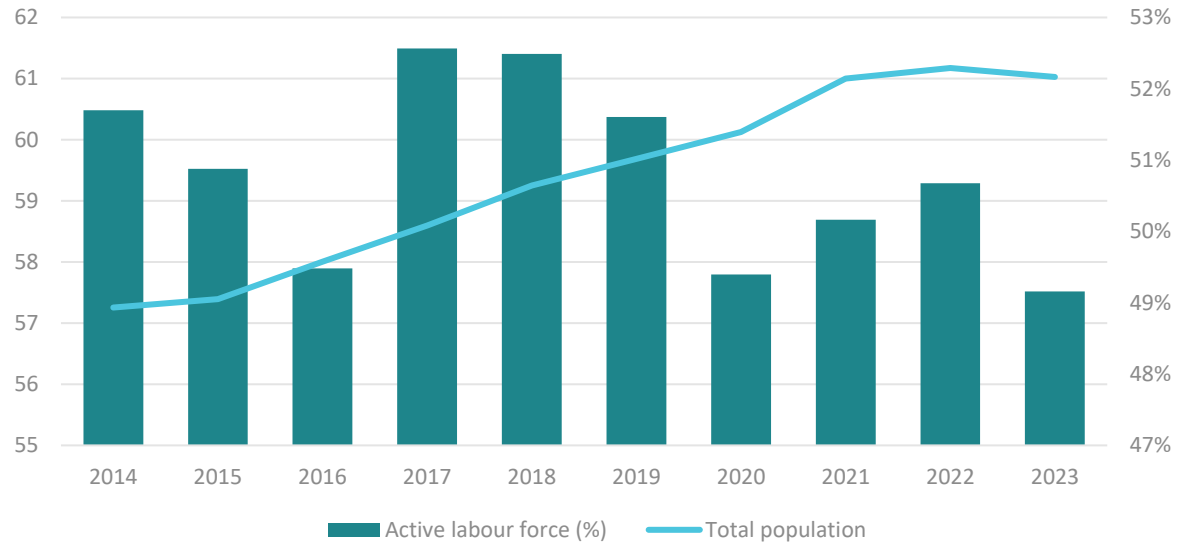
Source: Statistics Sweden

1.3 The labour force on Gotland

The labour force in Gotland has experienced uneven development over the past 10 years. As illustrated in Figure 5, despite the steady increase in the island's population, the percentage of the population active in the labour force steadily decreased until a sudden surge in 2017, followed by another steady decline. Although the percentage of the active labour force is slightly lower today than it was 10 years ago, the overall increase in population size implies that the nominal active population in 2023 is higher than in 2014.

The number of active individuals in the labour force is projected to continue following the historical trend of an average slow, but positive increase, reflecting the anticipated developments in the region's total population. Over the past 10 years, fluctuations have occurred, reaching the highest number of 31,100 in 2018 and the lowest of 28,700 in 2016. Most recently, the active labour force contracted from 31,000 people in 2022 to 30,000 people in 2023.

Figure 5 Active population in Gotland as a percentage of total population (thousands)

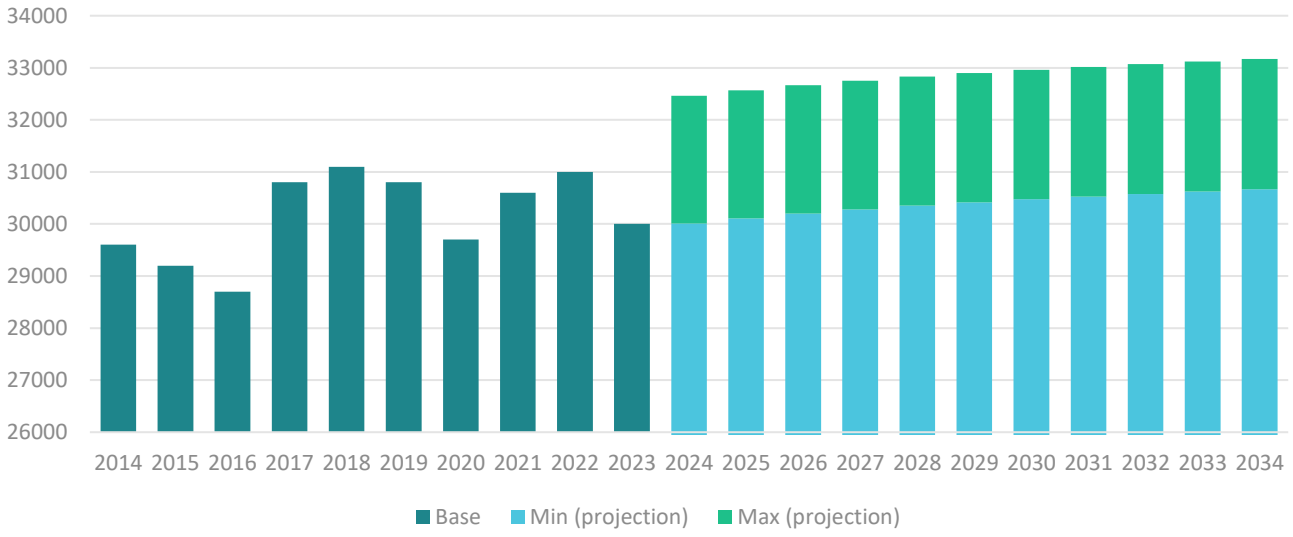


Source: Statistics Sweden

1.3.1 Projection of the work force on Gotland

The labour force projection shown in Figure 6 has been derived based on the population statistics factoring in the last 10 year's historical minimum percentage of the active labour force of 49 percent (creating a minimum projection line) and a maximum percentage of the active labour force of 53 percent (creating a maximum projection line). The total amount of people in the labour force is expected to fall somewhere within those lines and following the historical development described in the preceding sections. This means that by 2034, the active labour force is expected to be somewhere between 30,500 people and 33,000 people, which is not too different from today's level.

Figure 6 Gotland's labour force projection 2014-2023



Source: Statistics Sweden. Projection generated by COWI based on historical data and population projection developed by Statistics Sweden

1.4 The development in education levels

The level of education in Gotland is predominantly composed of individuals with upper secondary education, which accounts for 34 percent of the population in 2023. The second largest group comprises those with post-secondary education, making up 23 percent of the population. However, over the past decade, there has been a notable decline in the number of individuals with lower education levels, specifically among those who have completed only up to secondary education. In contrast, the number of people with higher levels of education has shown a consistent increase since 2014.

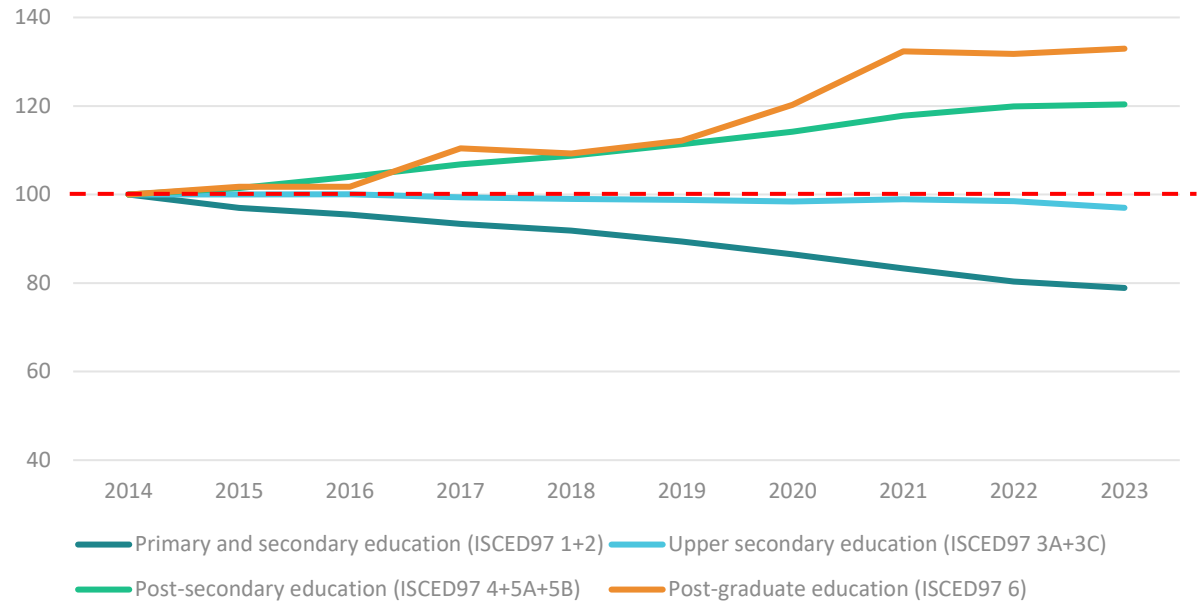
From 2014 to 2023, the population with post-secondary education experienced substantial growth of approximately two and a half thousand individuals, representing a 20 percent increase. Notably, the most significant change has been observed among individuals with postgraduate education, which has shown considerable year-on-year variations and a substantial increase of 32 percent between 2014 and 2023. These changes are presented in Table 1 below, which indexes the value for each level of education to the year of 2014, allowing for a clear observation of the changes in each educational category.

Table 1 Overview of Gotland's education level over the years of 2014 to 2023

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
	Total									
Primary and secondary education (ISCED97 1+2)	8606	8344	8213	8034	7905	7690	7446	7170	6916	6790
Upper secondary education (ISCED97 3A+3C)	21168	21173	21179	21028	20965	20905	20831	20941	20846	20533
Post-secondary education (ISCED97 4+5A+5B)	11910	12082	12386	12718	12957	13261	13603	14033	14279	14335
Post-graduate education (ISCED97 6)	173	176	176	191	189	194	208	229	228	230
No information about level of educational attainment	409	427	529	630	731	792	717	755	773	784
	Percentage change from previous year									
Primary and secondary education (ISCED97 1+2)	0%	-3%	-2%	-2%	-2%	-3%	-3%	-4%	-4%	-2%
Upper secondary education (ISCED97 3A+3C)	0%	0%	0%	-1%	0%	0%	0%	1%	0%	-2%
Post-secondary education (ISCED97 4+5A+5B)	0%	1%	3%	3%	2%	2%	3%	3%	2%	0%
Post-graduate education (ISCED97 6)	0%	2%	0%	9%	-1%	3%	7%	10%	0%	1%
No information about level of educational attainment	0%	4%	24%	19%	16%	8%	-9%	5%	2%	1%

Source: Statistics Sweden

Figure 7: Gotland's education level, index: 2014=100



Source: Statistics Sweden

1.5 Unemployment - development

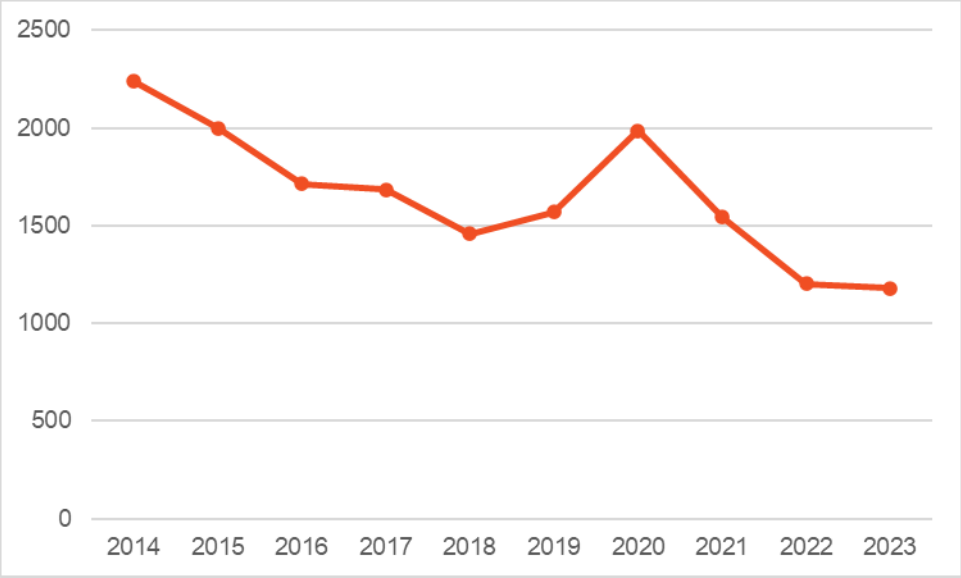
In recent years, the labour market on Gotland has been characterized by increasing employment over several years, as well as recruitment problems that have emerged in recent times. Gotland has a low unemployment rate compared to the rest of Sweden, and this rate has been declining for several years (see Figure 8). According to the National Employment Service, the unemployment rate in August 2024 was 4.1 percent, compared to a national level of 6.8 percent. It should be noted that these figures include long-term unemployed individuals.

In 2020 and 2021, employment was negatively affected by COVID-19; however, unemployment fell again in 2022 and 2023. There has been a slight increase in 2024, according to the monthly statistical statements from the Swedish Employment Service[2].

The unemployment rate in Gotland is generally low, but it fluctuates seasonally due to its significance as a tourist destination, attracting around 1 million visitors annually. During the summer, unemployment rates decrease, while they rise during the winter months. Nevertheless, there is a significant share of long-term unemployment, with approximately 1,000 individuals distanced from the labour force. As a result, there is a small but available workforce actively seeking employment opportunities.

[2] Swedish Employment Service, https://statistik.arbetsformedlingen.se/extensions/Manadsstatistik_sid1/Manadsstatistik_sid1.html

Figure 8: Unemployment in Gotland 2014-2023, Registered unemployed[3].



Source: https://arbetsformedlingen.se/statistik/

Gotland's labour market has experienced significant shifts and challenges over the years. In the 2000s, there were major layoffs in the Armed Forces and at Ericsson, causing economic shocks to Gotland's economy. To counter this, the Swedish central government created a number of job opportunities, becoming a major employer on the island. While many individuals found new employment, a substantial number also chose to leave Gotland. Older employees at Ericsson faced particular difficulty in finding new jobs, as some had worked there for many years and were less inclined to relocate. However, the employment agency, with the support of Flextronics and others, offered individual programs in collaboration with local trainers to provide the laid-off workers with new opportunities in the labour market.

The individuals laid off from the Armed Forces and Ericsson reacted differently. Some military personnel were from Gotland and thus remained on the island; however, in the case of Ericsson, which had a different workforce composition, many former employees chose to leave Gotland, a decision that was partly facilitated by Ericsson. Recent geopolitical events have led to the return of the Armed Forces, providing job opportunities in this sector. Meanwhile, the public sector continues to be a major employer on the island.

1.6 Development in employment by industry

As of 2022, there were 24.552 workplaces on Gotland and the total number of people employed on Gotland were close to 29.000. Gotland thus has a large proportion of very small businesses.

[3] Data from the National Employment Service are published monthly. The numbers in the figure are all from month of September in the respective years, as September is close to the annual average.

The biggest industry in terms of employment in Gotland (number of workplaces) is related to care and welfare and social services, followed by Public administration and defence and Education. This means that the public sector makes up the majority of the jobs on Gotland. Trade and construction are on the fourth and fifth places.

Table 2: Number of workplaces on Gotland by industry and year. 2014 - 2022

	2014	2015	2016	2017	2018	2020	2021	2022
Agriculture, forestry and fishing	659	597	602	650	624	584	611	597
Manufacturing and extraction	1.546	1.519	1.590	1.540	1.615	1.458	1.498	1.516
Energy supply; environmental activities	125	132	129	235	228	217	235	252
Construction activities	1.918	1.978	2.019	2.049	2.129	2.053	2.122	2.131
Trade	2.346	2.344	2.336	2.389	2.358	2.417	2.440	2.449
Transport and storage	1.095	1.077	1.085	1.095	1.124	980	1.000	1.001
Hotel and restaurant operations	1.291	1.392	1.376	1.402	1.458	1.207	1.427	1.338
Information and communication	282	278	298	306	312	268	248	265
Financial and insurance operations	607	600	554	578	610	639	661	691
Real estate operations	275	281	351	342	345	341	363	374
Business services	1.406	1.423	1.452	1.413	1.389	1.410	1.544	1.668
Public administration and defence	2.239	2.284	2.426	2.623	2.917	3.101	3.219	3.221
Education	2.584	2.670	2.671	2.756	2.708	2.735	2.757	2.811
Care and welfare; social services	4.518	4.645	4.712	4.615	4.657	4.698	4.647	4.635
Cultural and personal services, etc.	1.268	1.295	1.284	1.258	1.313	1.252	1.276	1.282
Unknown activity	432	367	388	411	401	369	342	321
Total	*22.591*	*22.882*	*23.273*	*23.662*	*24.188*	*23.729*	*24.390*	*24.552*

Source: SCB, Statistics Sweden

The number of workplaces on Gotland has increased by 9 percent from 2014 to 2022, i.e. from 22.591 to 24.552 workplaces, while the number of employed during the same period increased by 8 percent.

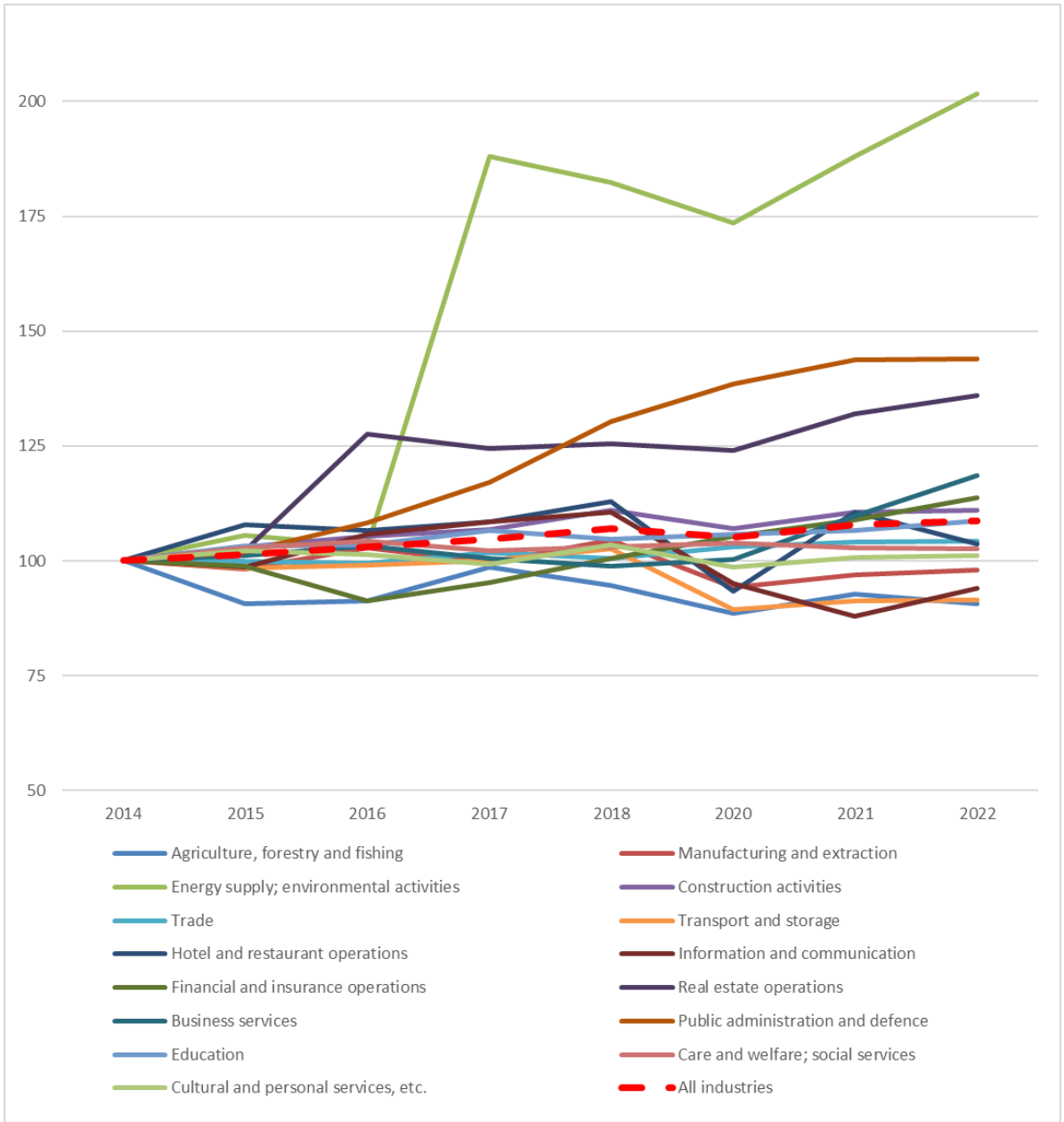
With regard to the development in workplaces on Gotland, it is worth noting that the biggest increase in new workplaces since 2014, was in energy supply and environmental activities, which have doubled the number of jobs from 125 to 252 workplaces (an increase of 102 percent).

In numbers, the biggest growth was in public administration and defence with 982 workplaces (44 percent), Business service with 262 workplaces (19 percent), Education with 227 workplaces (9 percent) and Construction with 213 workplaces (11 percent).

The growth in public administration and defence is to a high degree due to the increase in defence-related jobs on Gotland. In 2016, units of the Armed Forces were again stationed on the island and in 2018, the Gotland Regiment was re-established underpinning the development described in Table 2.

Within agriculture, forestry and fishing, transport and storage, and information and communication there has been a decline in workplaces. Within these industries, transport and storage are the biggest. In Figure 9 below, the development is described in index figures.

Figure 9: Workplaces on Gotland by industry and year. 2014 – 2022. 2014=100.



Source: SCB, Statistics Sweden

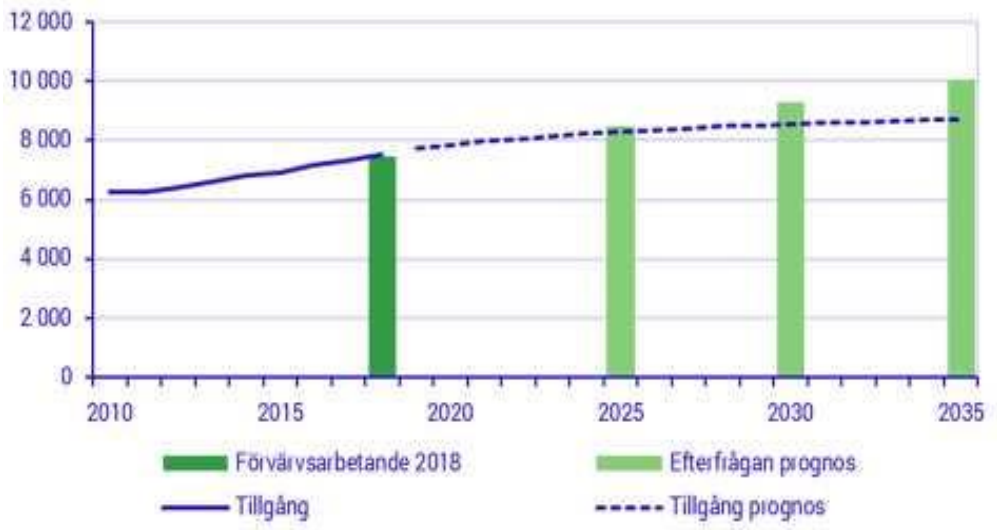
The projection for the coming decade is a rise in labour demand in the region. However, the supply of labour will not follow at the same pace, and the current projections is an imbalance in supply and demand leading towards a labour deficit.

Current projections from Statistic Sweden, SCB[4], identify several areas on Gotland that experience a deficiency of labour. Firstly, the number of individuals with an industrial engineering background will decrease. This group is mostly employed in manufacturing, construction and wholesale and retail trade today. Although demand for individuals with this background is expected to decrease with 15%, the supply is expected to decrease even more by 2035, with an expected decrease of approximately 50%, creating a risk of great deficiency in this area.

The second area include individuals with agriculture training, who are mostly employed in agriculture and forestry. The demand for this skill set is expected to increase by about 30%, while supply is expected to decrease by approximately 10%.

Finally, the last area at risk of great deficiency are individuals with a health care education. With a shortage of nurses already today, supply is expected to decrease by 25% while demand is expected to increase by 50%. This category of labour will be in serious deficit by 2035.

Figure 10 Labour supply and demand projection in Gotland



Source: Regional education and labour market forecasts, SCB, 2022.

1.7 Summary of the labour market development

- Gotland's population grew from 2014 to 2022, but a slight decline in 2023 marked its first negative growth, primarily due to a 13% decrease (almost 900 individuals) in the 20-29 age group, despite a notable 27% increase in the 30-39 age group.

[4] Regionala utbildnings- och arbetsmarknadsprognoser Prognosresultat för länet år 2035. Statistic Sweden, 2022.

Meanwhile, the population aged 70 and over saw a significant 33% increase, while the working-age population (20-69 years) decreased by approximately 200 individuals.

- The region's workforce remained stable over the past decade; however, the decline in the working-age population has negatively impacted the active labour force. Projections from Statistics Sweden (SCB) indicate slow population recovery and potential steady growth, with the active labour force expected to maintain levels similar to the last 10 years, albeit with questions regarding the accuracy of these forecasts.
- The region enjoys a low unemployment rate of 4.1% as of August 2024, significantly lower than the national rate of 6.8%. The number of jobs on the island has increased by 9% over the past eight years, reflecting a healthy local economy.
- There is a rising trend in higher education attainment, with about 2,500 more individuals holding post-secondary degrees since 2014, although there are anticipated skill shortages in key areas such as industrial engineering, agriculture, and healthcare over the next decade. This shortage is concerning given the region's economic dependence on these sectors for growth and employment.
- The island's relative isolation poses challenges for commuting, making it essential to attract and retain residents to sustain the workforce. Successful strategies for attracting labour must focus on providing adequate housing, a strong healthcare system, and job opportunities for spouses, alongside ensuring that the workforce is well-trained to meet future demands.

2 Green transition on Gotland

This section presents the projects that together make up the green transition on Gotland.

Green transition and reduction of CO2 emissions from production at Heidelberg Materials in Slite and Nordkalk in Storugns on Gotland is the core of the green transition of the cement and mineral industry on Gotland. The two companies plan to make large investments in their production facilities in order to complete the green transition.

The green transition of the industry will be based on renewable energy supply,from offshore wind farms, on the capture of CO_2 and either storing CO_2 in the sub-seabed or converting CO_2 into new green fuels (Power-to-X). The green transition of the production at the two companies is therefore dependent on access to both energy infrastructure and renewable energy production. Therefore, a number of follow-up investments in sustainable energy production and infrastructure are expected to be made.

The expected investments in both industrial transformation, energy infrastructure and renewable energy production are all independent investment areas. These will be treated separately in this analysis.

2.1 Planned investments on and around Gotland

The research for this analysis has identified and examined the following investments expected to be implemented in the coming years as part of the green transition on Gotland. The focus is on industrial projects at Heidelberg Materials and Nordkalk, as well as energy initiatives, including the energy grid, power connections, and renewable energy production. These projects are at varying stages of development, and currently, none have secured a final investment decision, fixed schedule, or budget.

The mapping of potential projects on and around Gotland has revealed a relatively extensive list, particularly regarding offshore wind farms. It is possible that some of the identified projects or investments may be delayed or cancelled, meaning that a final investment decision may not be made. Firstly, all projects must undergo a thorough environmental impact assessment. Secondly, the Swedish Armed Forces have the option to object to projects that they believe may affect their operations.

Several stakeholders have indicated that not all projects are expected to be fully implemented. In this context, it's important to note that on November 4, 2024, the Swedish government rejected 13 offshore wind farms that were under planning, several of which were intended to be located in the waters surrounding Gotland.

The Swedish government is currently conducting an official investigation into offshore wind power. The purpose of this investigation is to determine how the permitting processes for establishing offshore wind power can be made more efficient. The investigation will also assess whether future permits for offshore wind power should be issued by the state appointing entities. At present, energy companies can apply for permits to establish offshore wind farms through an entirely open process known as the open-door approach.

The projects are summarized in the tables below. Table 3 presents the two major projects in the cement and mineral industry on Gotland, specifically those at Heidelberg Materials and Nordkalk.

Table 3: Planned investments in the cement and mineral industry on Gotland

Project	Scope of investment	Expected time	Project status
Heidelberg Materials CCS	Carbon capture and storage from cement production	Construction 2027 - 2030. Commissioning in 2030	The project is in the planning process
Nordkalk CCS and e-fuels	Carbon Capture & e-fuel production on Gotland	The schedule has not been determined yet	Nordkalk is preparing a pre-study report which will further define the project

Table 4 presents the two energy infrastructure projects, which GEAB and Svenska Kraftnät are expected to perform.

Table 4: Planned investments within energy infrastructure on Gotland

Project	Scope of investment	Expected time	Project status
GEAB strengthening the local grid	Modernise and strengthen the local power grid on Gotland	Ongoing work until 2040	The project is divided into stages which are being implemented or planned
Svenska Kraftnät – mainland power connection	High-capacity mainland high voltage link	Expected to be in operation from 2030	The project is under development

Table 5 presents a number of offshore windfarms in the Baltic Sea, close to Gotland and one onshore windfarm on Gotland.

Table 5: Planned investments within renewable energy production on and around Gotland

Project	Scope of investment	Expected time	Project status
RWE: Elinor Offshore windfarm	Offshore wind farm with capacity up till 3 GW	Uncertain - beyond 2030 – 2035	The project is under development
RWE: Neptuni OWF	Offshore wind farm with capacity up to 1,6 GW	Construction phase 2029-2030. Commissioning in 2032	The project is under development
OX2: Ran & Pleione OWF	Offshore wind farm with capacity up to 2,8 GW	Commissioning in 2030	The project is under development
OX2: Aurora	Offshore wind farm with capacity up to 5,5 GW	Commissioning in 2030	The project is under development
Freja Offshore:	Offshore wind farm with capacity up to 2 – 2.5 GW	Commissioning in 2031 or 2032	The project is under development
EOLUS: Skidbladner OWF	Offshore wind farm with capacity up to 2.2 GW	Commissioning in 2032	The project is under development
EOLUS: Herkules OWF	Offshore wind farm with capacity up to 2.4 GW	Commissioning in 2035	The project is under development
SR Energy	Onshore Windfarm with up to 50 wind turbines	Commissioning in 2031	The project is under development

In addition to these projects, other development projects for green transition are also underway on Gotland. Among the largest are development projects at Gotland Tech Development, with plans to replace fossil fuels used by ferries with green fuels. The green fuels are expected to be produced by local suppliers, e.g. the project at Nordkalk and from local biogas or hydrogen.

2.1.1 Heidelberg Materials – CCS, Carbon Capture & Storage

Heidelberg Materials in Slite on Gotland is a major producer of cement and manufactures 75% of Sweden's need for cement. The factory produces approximately 2.2 million tonnes of cement annually (2023). The factory employs around 230 employees, and the total job creation amounts to 430 full-time jobs[5].

The cement production is very energy intensive, emittingconsiderable CO_2 emissions. The conversion (calcination) of limestone into cement results, in addition to the use of electrical energy, emissions of carbon dioxide from the limestone (about 60%) and the fuels used in the process (just under 40%).

The Carbon Capture and Storage (CCS) project has a potential to capture up to 1.8 million tons of CO_2 emissions annually, reducing Sweden's total carbon dioxide emissions by 4 percent. The project means that carbon dioxide will be captured, compressed, cooled and transported to a site in the North Sea, and then injected into the bedrock on the seabed. The carbon dioxide is converted over time into minerals and then becomes part of the bedrock.

The CCS project is a very ambitious project and according to Heidelberg Materials, the total investments in the project are estimated to be about 10 billion SEK (870 million EUR). Some public co-financing of the project is expected.

According to the current plans, the detailed design of the CCS facility will be carried out during 2024 to 2026. The permit process started in June 2024 and will continue for the next 12–18 months, i.e. until the beginning of 2026. An investment decision may be made by the end of 2026.

However, the investment decision will – in addition to the permits – depend on a strengthening of the energy grid, an upgraded mainland connection and regulatory changes regarding the capture of biogenic emissions of carbon dioxide (BECCS).

Project description in brief

The project includes investment in new technology on the cement plant in Slite, i.e. further purification of the flue gases, absorption, capture, condensation, tank storage facilities, pipelines to the port and construction of a pier for the loading of carbon dioxide at the port of Slite. The project involves extensive installation work, structural changes, construction of new plant parts and deepening of the port area and navigation channel.

A large part of the project will consist of equipment delivered in parts and installed on the site by companies specializing in this type of large industrial installations. Activities, such as earthworks, construction of buildings and adaptation of current process plants are less specialized and can be carried out by local contractors with capacity for the tasks.

[5] Interview, Heidelberg Materials, 5 July 2024.

Expected local impact on labour market in the construction phase

During the 3-5 years of the construction phase, up to 1,500 people are expected to work on the plant simultaneously. The local impact on the labour market during this phase will stem both directly from the construction project itself—such as construction work, earthworks, electrical installation, transport, and other partial deliveries—and indirectly from related services that support the project, including travel, accommodation, catering, and the delivery of goods and materials.

In direct relation to the project, local job opportunities will primarily be available for designers, mechanics, machine operators, electricians, welders, and project managers.

Indirect job opportunities will arise in sectors such as transport, hospitality, and catering, involving staff in hotels and restaurants, as well as in the trade and transport of both materials and personnel.

Expected local impact on labour market in the operational phase

In the operational phase, around 30 new jobs will be created within Heidelberg Materials to monitor and maintain the new production facility. An additional 70-90 jobs for subcontractors of services related to the new plant are expected to be added. Slite CCS has completed a feasibility study and the project is now entering the design phase.

2.1.2 Nordkalk

Nordkalk extracts limestone from a limestone quarry in Storugns, northern Gotland. Nordkalk processes 1 million tonnes of limestone per year. Nordkalk has approximately 50 employees, but as the company has largely outsourced tasks to subcontractors, the number of permanent jobs in connection with production is greater than this.

The production of quicklime requires a large energy input and the production results in a relatively large amount of GHG emissions. Nordkalk is planning to reduce the CO_2 emissions and the aim is fossil-free quicklime production,carbon neutrality and so called 'Net Zero' production by 2040.

Project description in brief

The green transition project at Nordkalk focuses on carbon capture and storage (CCS) and the establishment of e-methanol production on Gotland. The e-methanol production will utilize carbon dioxide captured during the manufacturing process.

Nordkalk has partnered with the energy company OX2 to develop sustainable energy from offshore wind turbines. The project is still in its early stages, and currently, there is no construction budget or schedule available. A feasibility study is expected to be completed at a later date.

The green transition project will involve investments in carbon capture technology, which aligns with the investments planned by Heidelberg. However, the Nordkalk project also includes plans for an e-methanol plant located near the factory. This e-methanol plant will be a large processing facility capable of converting captured CO2 into green fuel. The process will require a substantial electricity supply, which will be generated by offshore wind turbines. OX2's role in the project includes providing a sustainable electricity supply.

Expected local impact on labour market in the construction phase

During the construction phase, a total labour demand of approximately 300 full-time equivalents is expected. The majority of the workforce will be employed in the construction of the PtX plant, with a smaller portion dedicated to the carbon capture plant.

In direct relation to the green transition project, local job opportunities will primarily be available for engineers, project managers, mechanical and electrical installation crews, and other technicians.

Indirect job opportunities are anticipated in areas such as transport, storage facilities, hospitality, and building materials, including roles for drivers, hotel and restaurant staff, craftsmen, and shop assistants, among others.

Expected local impact on labour market in the operational phase

The project at Nordkalk will imply new jobs on Gotland, especially at the PtX plant. The number of jobs at Nordkalk is expected to increase from currently approx. 65 to more than 100 jobs. Most new jobs are expected to be within PtX production and a smaller number in connection with carbon-capture.

In addition, between 20 and 40 new jobs are expected to be created at subcontractors, primarily in relation to PtX production.

Demand can be expected for quarry machine operators, process operators, electrical and mechanical maintenance staff, mining engineers, process engineers, electrical engineers, maintenance planners. Finally, there will be new jobs in finance and human resources.

2.1.3 GEAB - upgrading the electricity grid

GEAB - Gotlands Energi AB - is the local grid company on Gotland. As responsible for the local electricity grid, GEAB must ensure that the local energy infrastructure is up-to-date and can supply the electricity for the green transition.

Project description in brief

GEAB is planning to upgrade the electricity grid on Gotland. The upgrade is part of a long-term investment plan till 2040, named Kapacitet Gotland (Capacity Gotland). As the mineral and cement industry is expected to require an upgraded electricity grid around 2030, GEAB's investments must take these developments into account.

Capacity Gotland is divided into several subprojects and implies establishing new power lines covering large parts of Gotland as well as modernising stations for power distribution.

The overall project is estimated to a value of at least 2 billion SEK (180 million EUR).

Expected local impact on labour market in the construction phase

The planned investments by GEAB on Gotland will imply both the establishment of local workplaces as well as require labour force from the Swedish mainland. The local workplace created will primarily be in the areas of earthworks, construction work, transport and other supporting tasks, whereas the more specialized installation tasks related to the power lines and power stations will be handled by companies from the mainland.

Expected local impact on labour market in the operational phase

The new and upgraded electricity grid will not imply increased demand for labour in the operational phase, but according to GEAB there will be changes in the skills which will be required in the coming years. GEAB foresees an increased need for power engineers and other technical competences and e.g. operators of the power grid surveillance center.

2.1.4 Svenska Kraftnät - New mainland connection

The increased electricity demand in Gotland over the coming decade will necessitate improvements in safe and efficient electricity connections between the island and the mainland. Svenska Kraftnät, the authority responsible for Sweden's power transmission system, is planning the construction of a new high-voltage connection to replace the current one

The new connection will consist of two 220 kV submarine cables, which will be laid from Misterhult, near Oskarshamn, to Stenkumla on Gotland. The connection will be approximately 118 km long, with 18 km on land and 100 km underwater. The exact route will be determined following consultations with authorities, property owners, and local residents. The connection is expected to become operational in 2030, with the existing cable remaining in operation as a reserve capacity.

This new connection will supply electricity to the green transition projects at Heidelberg and Nordkalk. However, it will not have the capacity to accommodate power exchange from future wind farms around Gotland or to generally increase power exchange between Gotland and the mainland.

Currently, there is no information available regarding the local impacts of this project on Gotland.

2.1.5 Offshore windfarms near Gotland

A number of energy companies have been developing plans for offshore windfarms (OWF) around Gotland. These projects are relevant for the green transition on Gotland, partly because they will supply the cement and mineral industry with sustainable energy and partly because the OWF's themselves will create green transition jobs on Gotland.

The planning of these energy projects is complex. Firstly, the projects must go through extensive official evaluation, including an assessment of the environmental consequences in an environmental impact assessment. Secondly, the projects must be coordinated with the overall Swedish energy planning, as the Swedish government is in the process of preparing the overall planning for energy supply for Sweden. And finally, considerations in relation to national security need to be included as the projects must be assessed by the authorities responsible for the Swedish defence (Swedish Armed Forces).

As previously mentioned, great uncertainty has arisen with regard to the future of energy production, based on offshore wind. Due to the decision of the Swedish Government not to approve 13 applications for off-shore wind due to security concern it is therefore very uncertain whether offshore wind farms will be established to the extent described.

The map below illustrates the location of offshore wind farms around Gotland, i.e. projects for which feasibility studies have been carried out.

Figure 11: Map of potential offshore windfarms near Gotland, Sweden, as of October 2024.

Source: Websites from the different energy companies

Project description in brief

The offshore wind farms (OWF) projects covered in this analysis are project under development by the energy companies RWE, OX2, Freja Offshore and EOLUS.

RWE is developing the projects Elinor[6] with a potential up to 3 GW effect and Neptuni[7] with a power potential up to 1,6 GW effect. The schedule for Elinor is somewhat uncertain – it is expected to be commissioned between 2030 and 2035. Neptuni could be implemented in the period from 2029 or 2030 and commissioned in 2032.

OX2 is developing the project Aurora[8] with a potential up to 5.5 GW and Ran[9] and Pleione (Ran and Pleione are part of the same overall project) with a potential up to 2.8 GW effect. Pleione[10] is planned to be af floating OWF. Both Aurora and Ran and Pleione are expected to be commissioned from 2030.

Freja Offshore are developing several OWFs in the Baltic Sea. The Dyning[11] project, northwest of Gotland, is according to Freja Offshore the most relevant project for Gotland,

[6] Elinor | Greenfield project of RWE in Sweden
[7] Neptuni
[8] Projects - OX2
[9] Projects - OX2
[10] Projects - OX2
[11] Freja Offshore - Floating offshore wind power far out at sea

because of its proximity to Gotland. The project is estimated to have a potential with up to 2 – 2.5 GW effect, based on floating wind turbines. The timetable is not confirmed, the OWF is planned to be commissioned in 2031 or 2032.

EOLUS is developing two large OWF in the Baltic Sea, Skidbladner[12] and Herkules[13] with a potential up to 2.2 and 2.4 GW effect. Both OWFs will be situated east of Gotland. This is further east than the other planned OWF's. The windfarms could be in operation in 2032 and 2034, according to the present plans.

Expected local impact on labour market in the construction phase

The construction of offshore windfarms is a very complicated process that involves a wide range of stakeholders; an energy company (owner and developer of the OWF), wind turbine manufacturers, logistic companies, ports and a local support function, including storage of material, local transport, accommodation, minor repairs of equipment, etc.

The experience, from international cases with newer OFWs, that the local contributions in the construction phase mainly consist of logistics support for the construction of the OWF (so-called pre-assembly activities) and local supply of food and daily necessities for crew on special vessels, the wind turbine manufacturer's employees etc.

An adequate port on Gotland will probably be necessary to receive the wind turbine parts and prepare these before they are to be installed on an offshore site. The wind turbine supplier and the energy company will bring specialists to carry out this work, but the supplier will often request local service for transport tasks, daily necessities, minor repairs, accommodation and food for employees, etc.

The actual installation of the wind turbines will take place from special vessels, which bring an international team of employees for this task.

An OWF also includes substations which receive the power produced by wind turbines, transmitted by power cables buried in the seabed. Once the power reaches the substation, the electricity is stepped up to a higher voltage and sent onshore via high voltage cables. Both substations and cables are produced elsewhere and installed at sea from special vessels. The local contribution to these tasks will be smaller, primarily with the supply of food etc. to the vessels.

However, it should be noted that the specific working methods and use of subcontractors, local partners, etc. in connection with the construction of the OWFs may vary, depending on the decisions of the wind turbine suppliers and the energy companies. It is the energy companies and wind turbine suppliers who decide how they want to implement the project and which infrastructure they want to use.

Expected local impact on labour market in the operational phase

The operation of an OWF means demand for service and maintenance of the wind turbines throughout the lifespan of the OWF. The owner of an OWF is expected to establish a service port (O&M Port) close to the OWF, from which technicians can sail and service the turbines. The energy companies that plan an OWF near Gotland emphasize that Gotland has a relevant location for an O&M port for the planned OWF.

[12] Skidbladner – Eolus
[13] Herkules – Eolus

An offshore O&M port will employ technicians (especially electricians, blacksmiths, mechanics) warehouse workers, office workers and crew members for the service boats that service the wind turbines with the technicians.

As at least four large OWFs were being planned around Gotland, the O&M activities in ports on Gotland implies quite a few new jobs for technicians and other specialists, etc. However, it has not been determined that the energy companies will use port facilities on Gotland for these activities. It is the energy companies who decide where the individual O&M port should be located, as they assess whether they can gain access to the relevant infrastructure (ports etc.) and can recruit the relevant specialists.

2.1.6 Onshore windfarm on Gotland

Project description in brief

The Swedish energy company SR Energy is planning the establishment of an onshore windfarm centrally on Gotland[14]. The windfarm is expected to include up to 50 wind turbines with an effect of 8 MW each. The project will include installation of the wind turbines, road access to the turbines, foundations for each turbine, a transformer station, cable connection to either the GEAB network or Svenska Kraftnät's network.

The value of the overall project is very roughly estimated to 500 – 600 million EUR.

Expected local impact on labour market in the construction phase

The project is expected to bring local jobs in the area of earthworks and construction work related to the foundations, road access and cable connections and other supporting tasks. Transport and installation of the wind turbines are considered to be specialized tasks which demands highly specialised staff and equipment and will be handled by companies from the mainland.

Expected local impact on labour market in the operational phase

The operational phase of the onshore windfarm will require service and maintenance of the wind turbines throughout the lifespan of the windfarm. SR Energy expect a permanent staff of 5 – 10 employees. The required professional background will be electricians who have received additional training and education to handle this task.

[14] Gotland - SR Energy

3 Labour market impacts of the green transition

The mapping of future projects for green transition on Gotland in section 2 shows, that there is potential for a large number of new jobs on the island in the coming decade and beyond. The plans for the analysed projects are not final and there may therefore be changes in the coming years, both with regards to the size of the projects and the time frames and thus the number of jobs that will be created in relation to each project. This is emphasized by the current situation regarding offshore wind farms in the Swedish part of the Baltic Sea.

In this section, the potential impact of these projects on the labour market and the number and type of jobs is analysed in more detail.

3.1 Approach to the analysis of labour market effects

In this analysis, the impact of the investments on the local economy is divided into effects in the construction phase and effects in the operating phase.

The construction phase is defined as the phase in which the project is built, i.e. that offshore wind farms are built, cables are laid, equipment for CO^2 capture is installed, infrastructure is built, etc.

The construction phase differs from the operation phase by being relatively short but, on the other hand, very intensive and with significant labour input, whereas the operation phase is less labour-intensive and lasts the entire lifespan of the project – perhaps 30 years or more.

The identified planned investments in offshore windfarms on Gotland are estimated to be substantial and are expected to amount to 2 billion SEK, although there are no published budgets for most of the projects.

For an analysis of the labour market effects, the scale of the investments will usually be the key to assessing the labour requirements for the construction phase of the projects. Since the construction budgets are not known in most cases, this part of the analysis will be based on estimates, drawing on experience from comparable projects[15] and from estimates from the involved stakeholders, where available.

With regard to the operational phase of the projects, in most cases information regarding required labour has been collected from during interviews with different stakeholders in the offshore wind industry.

3.1.1 Reservations and uncertainties

The assessment of labour market effects from large infrastructure investments is subject to the following uncertain variables:

- As this report illustrates, there are several projects related to the green transition on and around Gotland. There is no certainty that all these projects will be

[15] Data has been collected from the report regarding Energy Island Bornholm: Energy Island Bornholm, Business Potentials. Bornholms Regionskommune, 2022.

completed within the planned timeline, nor that decisions will not be made to cancel some of the currently planned projects.

- It can be expected that there will be discrepancies between the estimated impacts on the local labour market and the business environment in Gotland and the actual effects, both in the short and long term. Given the limited capacity of the local labour market, it is likely that the companies responsible for these investments will adjust their expectations for local recruitment and contracts to reflect these conditions.
- The offshore wind farm (OWF) projects in question on and around Gotland are all large-scale endeavours. Currently, there is limited experience with implementing OWF projects at this scale and the resources required for their execution. The estimates in this report are based on expert judgments derived from other analyses, and it is noted that these are very rough approximations.

Previous analyses of the regional economic effects of onshore wind turbines in Sweden have been conducted; however, these analyses are relatively old and may not fully reflect today's circumstances.[16].

3.1.2 Distinction between construction phase and operational phase

The short and very intensive construction phases of large infrastructure/industrial projects can have a significant impact on the local economy. A massive impact on the economy, can have a so-called 'shock effect', which can cause imbalances, e.g. create a shortage of labour, rising prices, etc. Experience also shows that large industrial investments and investments in infrastructure place great demands on both the capacity of the companies and on special qualifications of the workforce, i.e. technical specialists, engineers, construction workers of which there is often a shortage in a small labour market.

Large construction projects will often demand different supplies, services, etc., e.g. transport and logistics, storage facilities, catering, accommodation facilities. This type of supplies and services will be more likely to be delivered from local companies.

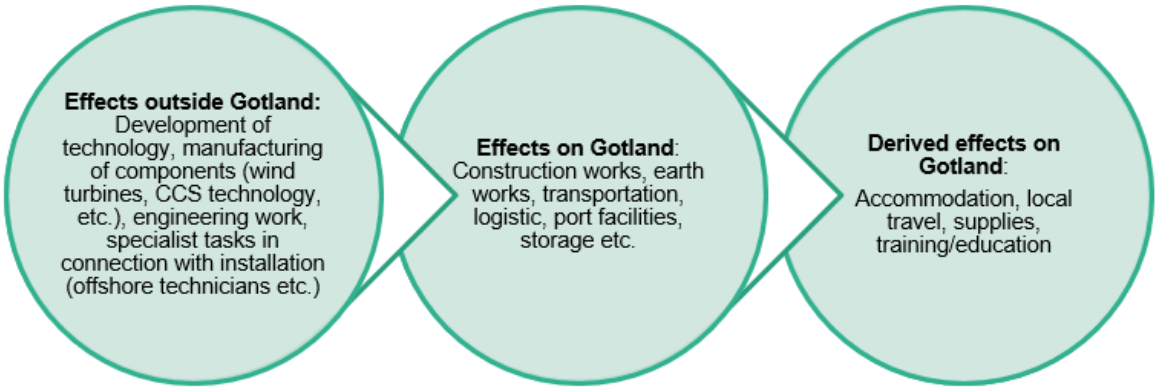
This suggests that the local companies, business organisations etc. should focus on becoming supplier and service provides for services, deliveries, etc. related to large construction tasks, and to a lesser extent aiming at supplying for the direct tasks in the construction phase, where the local companies often have neither expertise nor capacity.

As mentioned above, the operational phase of the project covers the period after the completion of the facility and extends over the entire life of the investment. The effects on the local labour market will consist of labour for the job functions at the facility (daily operation of the facility, production, etc.), and tasks in connection with maintenance of the facility. Thus, the operational phase has long-term effects on the local labour market and provides the opportunity to build capacity and competences in the companies and their employees to cover the tasks required.

The figure below describes how the labour market effects can be described in principle.

[16] See for example (In Swedish): https://vindkraftcentrum.se/wp-content/uploads/2015/01/arbetskraftforsorjning_och_sysselsattningseffekter_vid_etablering_av_vindkraft_morttjarnberget.pdf

Figure 12: Labour market effects



3.2 Labour market effects of the planned green transition projects

3.2.1 Construction phase for the planned investments on Gotland

The construction phase for the planned investments on Gotland in relation to the green transition will extend over a number of years, and a very large part of the activities will take places between 2027 and 2032 according to the plans. GEAB's strengthening of the local electricity grid and at least one of the OWF is expected to have a construction period beyond 2032.

In Tables 6, 7 and 8 below, an assessment of the total labour and the local input is summarized and (based on estimates from Heidelberg Materials and Nordkalk and COWI's estimates and experience).

In relation to the OWF's, the main part of the assessed total labour input concerns production of the wind turbines and the transportation from factory to the installation site. In this assessment the installation activities are assumed to be on sites close to Gotland, i.e. pre-assembly activities, local logistics, installation vessels etc. As the size of the planned OWFs varies, the estimates vary from project to project, according to the size of the planned OWF investments. For other projects, estimates are either not available or very uncertain.

The numbers mentioned in the table are 'rough' estimates, based on information from local stakeholders in the cement and mineral industry and COWI's experts in the field. Large parts of the work will take place outside Gotland, i.e. in connection with the manufacture of wind turbines, cables, installations for CO2 capture, etc.

All numbers are FTE's (full time equivalent of one person in one year).

Table 6 presents a summary of the expected impacts in the cement and mineral industry on Gotland, both directly with the construction and installation of new equipment and new production facilities.

Table 6: Estimated labour market impact from investments in the cement and mineral industry on Gotland

Project	Total estimated labour input	Expected time	Local impact
Heidelberg Materials CCS	Up to 1,500 FTE's	2027 - 2030.	100 – 150 FTE's
Nordkalk CCS and e-fuels	Up to 300 FTE's	n/a	50 - 100 FTE's

Table 7 summarizes the expected effects of the tasks related to the upgrade of the energy infrastructure on and to and from Gotland, i.e. the local power grid on Gotland and a new high-capacity power connection between Gotland and the mainland.

Table 7: Estimated labour market impact from energy infrastructure on Gotland

Project	Total estimated labour input	Expected time	Local impact
GEAB strengthening the local grid	Up to 1,000 FTE's	Ongoing work until 2040	Up to 500 FTE's
Krafttnett – mainland power connection	n/a	Expected to be in operation from 2030	n/a – but expected minor impacts

Table 8 summarizes the expected impacts from a number of offshore windfarms in the Baltic Sea, close to Gotland and one onshore windfarm on Gotland. As mentioned elsewhere in this report, there is currently great uncertainty about the future of offshore wind farms in the Baltic Sea, due to decisions by Swedish authorities.

Table 8: Estimated labour market impact within renewable energy production on and around Gotland

Project	Total estimated labour input	Expected time	Local impact
RWE: Elinor Offshore windfarm	Up to 2,500 FTE's	Uncertain - beyond 2030 – 2035	200 – 300 FTE's (transport and logistics, storage facilities, catering, accommodation)
RWE: Neptuni OWF	Up to 1,200 FTE's	2029 - 2032	100 – 150 FTE's (transport and logistics, storage facilities, catering, accommodation)
OX2: Ran & Pleione OWF	Up to 2,400 FTE's	2028 - 2030	200 – 300 FTE's (transport and logistics, storage facilities, catering, accommodation)
OX2: Aurora OWF	Up to 4.500 FTE's	2027 - 2030	300 – 400 FTE's (transport and logistics, storage facilities, catering, accommodation)
Freja Offshore: Dyning OWF	Up to 2,200 FTE's	2030 - 2032	180 – 260 FTE's (transport and logistics, storage facilities, catering, accommodation)
EOLUS Energy: Skidbladner OWF	Up to 2,400 FTE's	2030 - 2032	200 – 300 FTE's (transport and logistics, storage facilities, catering, accommodation)

EOLUS Energy: Herkules OWF	Up to 2,500 FTE's	2033 - 2035	200 – 300 FTE's (transport and logistics, storage facilities, catering, accommodation)
SR Energy: Onshore windfarm on Gotland	Up to 500 – 600 FTE's	2030 - 2031	80 - 100 FTE's (transport and logistics, storage facilities, catering, accommodation)

Possible local impacts

As mentioned earlier, these estimates must be used with caution, especially as it is not known whether a final investment decision will actually be made for some or all the OWF and other green transition projects.

For all the investment projects, the local impacts are estimated to a total circa 2,500 FTE's. As information is not available for some of the projects, it is assumed that the number may be somewhat higher, probably 3,000 FTE or more, should all the projects be implemented. This will again depend on the specific size and planning of the projects and how the projects will be executed.

It is also important to underline that the number of FTEs must be distributed over the expected construction period. 3,000 FTE will thus correspond to 500-600 full-time employees for a period of five to six years.

Job types and skill requirements

The types of jobs will vary from project to project. For the OWFs, the local assignments will primarily be within transport and logistics, catering, accommodation and supply of goods. For the projects with green transition of the industry, the activities will typically be in the building and construction industry, i.e. earthworks, transport, bricklaying and carpentry, installation tasks, scaffolding, general supply, etc.

3.2.2 Operational phase for planned investments on Gotland

The operational phase of the projects differs significantly from the construction phase. Where the job effects in the construction phase are temporary, the job impacts in the operation phase cover jobs throughout the life of the project, i.e. many years – perhaps decades – ahead. These jobs are thus permanent jobs.

Also in the operational phase, there is a big difference between the projects and how they are expected to affect the local labour market. For several of the projects, the impact in the operational phase will be limited, as the transition primarily consists of switching from an old to a new technology, which may cause new demands on skills, but does not necessarily mean more jobs.

For other projects, the green transition creates opportunities for new jobs, and opportunities are created for new business areas because the local companies gain new knowledge and gain access to new markets and new technologies, e.g. for service and maintenance of wind turbines and other installations.

Assessments of the effects are uncertain, as the investments projects do not have estimates of the labour needs yet. The estimates in the table are therefore based on

COWI's experience from analysis of other investment projects the energy sector in other geographies.

In Table 5 below, the job effects for the operational phase are summarized. All numbers are FTE's (full time equivalent for one year).

It is important to emphasize, that the labour market impact in the operational phase must be considered as a potential effect. The investors and operators may choose to organize the operation of the investment differently than assumed in this report, for example with regard to the involvement of local collaborators and subcontractors.

Table 9: Estimated labour market impact on Gotland from cement and mineral industry projects in the operational phase

Project	New job opportunities	Total estimated labour input on Gotland (FTE)
Heidelberg Materials CCS	Operation of carbon capture facility, pipelines, storage and shipping	100 – 120
Nordkalk CCS and e-fuels	Operation of carbon capture facility, PtX factory pipelines, storage and shipping of green fuels	35

Table 10: Estimated labour market impact on Gotland from energy infrastructure projects in the operational phase

Project	New job opportunities	Total estimated labour input on Gotland (FTE)
GEAB strengthening the local grid	Few new opportunities, but a general need for specialists	-
Krafttnett – mainland power connection	Few new opportunities	-

Table 11: Estimated labour market impact on Gotland from renewable energy projects in the operational phase

Project	New job opportunities	Total estimated labour input on Gotland (FTE)
RWE: Elinor Offshore windfarm	Maintenance staff, boat crew etc.	100 - 200
RWE: Neptuni OWF	Maintenance staff, boat crew etc.	100 - 200
OX2: Ran & Pleione OWF	Maintenance staff, boat crew etc.	100 – 200
OX2: Aurora	Maintenance staff, boat crew etc.	100 - 200
Freja Offshore:	Maintenance staff, boat crew etc.	100 - 200
EOLUS Energy: Skidbladner OWF	Maintenance staff, boat crew etc.	100 - 200
EOLUS Energy: Herkules OWF	Maintenance staff, boat crew etc.	100 - 200
SR Energy: Onshore windfarm	Maintenance staff	10

Job types and competence requirements

The new job opportunities in relation to carbon capture and the production of green fuels will especially arise within the industries of processing industry, transport and logistics. These jobs are comparable to jobs within the chemical industry, i.e. monitoring of process plants, tank plants, etc.

Regarding the offshore windfarms, the local labour marked effects mainly relate to the operation of so-called O&M activities, i.e. maintenance of the offshore wind farm. For the maintenance work, a base port must be available – also called an O&M port (operation & maintenance port). From here, technicians sail to the offshore wind farm and carry out maintenance work. The staff for these types of activities will primarily consist of electricians, blacksmiths, mechanics, warehouse workers, office workers and crew members for the service vessels.

The identification of offshore wind farms shows, that up to 6 OWF, which involve three different energy companies, can be expected close to Gotland. The size of the OWFs has not been decided, but the plans assumes that extensive facilities for O&M ports, with associated staffing, must be established. Apart from the demand on labour these projects will require extensive infrastructure development on Gotland.

Derived effects in the operational phase

The operational phase will also impact other sectors and businesses on Gotland. Today, both Heidelberg Materials and Nordkalk use service suppliers for many tasks, e.g. for plant maintenance, for transport work and building operations, minor construction tasks, etc.

These activities can be expected to grow in the future and so will the demand on this type of service providers. In addition, the OWF projects will probably result in increased travel activity to Gotland, i.e. the demand for travel (air and sea), hotel accommodation, catering and other supplies is expected to increase.

However, some skills needs are expected to be highly specialized and will probably imply demand for services that can only be conducted or delivered on the mainland.

Finally, there may be additional effects of the green transition on Gotland. As a result of the local companies' experience with the operation of CCS plants and PtX plants as well as with the operation of offshore wind farms, new skills and expertise are developed, and new business opportunities can arise.

However, these effects are particularly difficult to estimate, due to the many different aspects and actors that have to support this kind of development i.e. entrepreneurs, investors, trained labour etc.

3.3 Summary of the estimates of local impacts on Gotland

The following will include an assessment of the employment effects on Gotland. The figures should be used with caution, as it is uncertain whether a final investment decision will be made for all projects.

3.3.1 Short term and temporary effects:

The short-term and temporary effects of the green transition on Gotland relate to the jobs that are created in connection with the OWF construction and construction of the new facilities and installations, which are described in section 2 of this report.

The estimated job effects are approx. 3,000 FTE, most of which will be in the period up to approx. 2032. As the projects are currently in the planning phase, it must be expected that employment will culminate in the latter half of this period, i.e. approx. 2028/2029 till 2032.

This will mean a job potential of up to 500 – 600 new jobs locally on Gotland, distributed over a period of 5-6 years. Adding to this are the job effects in local businesses; accommodation, local transport, supply of goods etc., which are very difficult to estimate.

The potential job will mainly cover the following job categories:

- Storage workers
- Crane operators
- Truckdrivers
- Electricians
- Construction workers

3.3.2 Long term effects

The long-term labour effects of the green transition on Gotland concern new jobs created in relation to the operation of the green transition investments. These are in principle permanent jobs, i.e. they exist during the lifetime of the facilities.

The potential for long-term jobs is approx. 135 - 150 new jobs related to CCS and green fuel production in the cement and mineral industry on Gotland, and up to 1,200 new jobs related to O&M ports in connection with OWFs.

The potential long-term jobs mainly cover the following job categories:

- Process operators
- Black smiths
- Electricians
- Mechanics
- Seamen
- Storage workers
- Drivers
- Administrative staff

Other potential long-term effects could be jobs related to the maintenance of buildings and other facilities stemming from increasing travel activity to Gotland, which means increased demand for hotel staff, shop staff, etc.

3.4 Potential challenges for the local labour market on Gotland

This analysis shows that the green transition may result in considerable changes in the local labour market on Gotland.

The green transition will first and foremost mean that the cement and mineral industry on Gotland must introduce new technologies that can contribute to the reduction in CO2 emissions.

Introduction of these technologies will be based on sustainable electricity production, i.e. from offshore windfarms, which are planned to be built in the waters around Gotland. In addition, there must be an upgrade of the energy infrastructure on and around Gotland, in the form of a better electricity grid and better connections between Gotland and the mainland.

The implementation of the green transition investments will require a significant demand for labour, but experience shows that the majority of the need will be highly specialized and will be based on labour from the mainland. In this phase, local demand will focus on support functions, which the local labour market can probably handle well.

The long-term development can be a challenge

The long-term demand, i.e. labour demand, which relates to the operation of the investments in sustainable production and energy supply, will in turn place great demands on the labour market on Gotland. First of all, this will imply demand for a particularly large number of skilled individuals in industrial production, transport and logistics and in the maintenance of technical facilities, especially offshore wind turbines. The increasing demand for labour will especially concern technicians (blacksmiths, electricians, mechanics, etc.) and maritime staff, transport and logistics specialists, etc. In the operational phase, the workforce should preferably be local, as it is costly – and a possibly instable solution - to transport personnel to and from Gotland to carry out these activities.

In addition to the direct operational and maintenance tasks, there will probably be derived effects on the labour market, primarily in relation to the operation and maintenance of buildings and ports, various repairs, catering, accommodation and travel activities.

The green transition impact on the labour market is due to a combination of, firstly, an increasing demand for labour with specialised education and skills and, secondly, that Gotland does not necessarily have the necessary workforce to meet the increasing demand for labour. At present, the unemployment rate on Gotland is very low and the trend is still decreasing.

Furthermore, the long-term development of the workforce on Gotland is uncertain and is closely related to the development inf population size and the of the future of new relocation to the island. In the case that Gotland would experience a decline in population in the coming years, this is expected to have a negative impact on the workforce, and thus the ability to recruit labour for the new jobs created by the green transition.

On the other hand, the growth in new job opportunities on Gotland may imply that more people may become interested in settling on Gotland and thus contribute to strengthening the capacity of the workforce on the island. In that case, it will require additional investments social, health and educational infrastructure e.g. housing options, education and further education opportunities and other local services.

3.5 The long-term labour market development on Gotland

The report 'Regional education and labour market forecasts - Forecast results for the county in 2035'[17] by the Swedish Statistics Bureau SCB, contains a projection of the expected labour market situation for general education groups and sectors until 2035. The report analyzes the expected demand and the expected supply of labour in the long term.

The analysis was published in 2022 and parts of the data is from 2018. The long-time perspective of the analysis entails some uncertainty with regard to the results of the analysis. Nevertheless, the analysis highlights a structural development of the labour market on Gotland that is relevant for this present analysis.

It is furthermore important to note that the assessment in the report from SCB was prepared before the plans for green transition were made public and therefore does not include the expected development caused by the green transition on Gotland. The report thus provides a baseline for the socio-economic analysis.

The analysis is divided by industry and the most important professional groups and education groups per industry. For each of the industries, an assessment has been made of the long-term development trend as well as an assessment of the long-term recruitment situation for the most important professional groups.

In the construction phase, the following industries or sectors on Gotland can be expected to be affected positively:

- Transport and logistics
- Accommodation and catering (hotels and restaurant etc.)
- Building and construction
- Purchase and supply of goods and necessities

In the operational phase, i.e. the long-term effects, the following industries or sectors on Gotland can be expected to be affected:

- Industry and production (process industry etc.)
- Transport and logistics (transport, logistics, storage, port operations etc.)
- Maintenance of wind turbines and other energy installations
- Building and construction
- Accommodation and catering (hotels and restaurant etc.)

Comparing these effects or impacts against the projections of the report 'Regional education and labour market forecasts (SCB 2022)', it is possible to see where barriers may arise in the labour market. However, cautions must be made when interpreting and comparing the projections, due to the fact, that the categorization of industries in the labour market report do not completely correspond with the categories used for this this analysis.

[17][17171717] In Swedish: Regionala utbildnings- och arbetsmarknadsprognoser - Med sikte på år 2035. Statistics Sweden, SCB, 2022

Table 12: Labour market development on Gotland until 2035[18]

Industry	Number of employees (2028)	Forecast for Gotland until 2035	Results of green transition
Transport and logistics	There are around 610 employed persons (2018) with transport related educations in Gotland.	The supply of people with a transport education is expected to increase slightly the coming years. The demand is also expected to increase slightly the coming years. The labour market in this industry is therefore expected to be in balance for the coming years.	An increase in the demand, related to the green transition might therefore result in af deficit of labour in this area.
Accommodation and catering (hotels and restaurant etc.) (restaurants and food)	Around 920 working people in Gotland County had a restaurant or food education in 2018.	The supply of people with the relevant educations are expected to increase slightly the coming years. The demand for educated staff in the industry is expected the increase with a higher rate than the supply, which might lead to a deficit in trained labour.	This deficiency may be increased by the green transition.
Building and construction	There are approximately 920 employed persons in Gotland County with a secondary building education.	The number of people with the relevant education or training is expected to increase slightly over the coming years. However, the demand for labour is expected to increase even more. According to the report, there are already some shortages of woodworkers, carpenters and other occupations in construction industry.	It is expected that the local construction industry will be affected to a relatively large extent by the green investments on Gotland, i.e. in connection with the maintenance of wind turbines and industrial plants. This means that the deficiency may be further increased.
Purchase and supply of goods and necessities Trade and administration only partially corresponds.	There are around 1,600 employed on Gotland with the related educations.	The forecast expects the supply of this type of labour to decrease over the coming years. The demand is also expected to decline, due to a shift the need of competencies in the administrative part of the industry.	The green transition may mean increasing demand for employees in specialized areas, e.g. in the wholesale area and specialty stores.
Industry and production (process industry etc.)	980 persons employed with educations within process engineering, product and mechanical engineering and welding technology etc.	The number of people on Gotland with these educations are expected to decrease with up to 50 percent until 2035. In the same period the demand is also expected to decrease, but only by 15 percent. This means, that Gotland is expected to look into an extensive shortage of trained labour the coming years.	This shortage might develop further, in light of the expected increase in activity, i.e. related to future PtX facilities, carbon capture facilities etc.
Maintenance of wind turbines and other energy installations	There are around 900 employed persons in Gotland with upper secondary education in electrical engineering, automation, computer or communication technology.	There is a deficiency of trained labour in this industry today. In this context, it is especially electrical engineering which is relevant. Availability of people with these educations is expected to remain relatively unchanged over the forecast¬ period. The demand is expected to be stable, which means there might be a deficiency of these people in the future.	Especially the maintenance of wind turbines and industrial plants will mean the need for more specialists in this area.

[18] In Swedish: Regionala utbildnings- och arbetsmarknadsprognoser - Med sikte på år 2035. Statistics Sweden, SCB, 2022.

4 Attractiveness of Gotland as a driver for long-term development

Attracting labour will be extremely important, if not crucial, for the development of the green transition on Gotland in the coming years. As this analysis points out, the labour market on Gotland can expect to be significantly affected by increasing demand for labour and for specific skills in the coming years. The ability to attract and maintain the workforce on Gotland will therefore play a major role, especially in the future. Several studies already conclude that a lack of worker with relevant skills risk holding back the green transition[19].

At the JTP Workshop[20], the question of Gotland's attractiveness – both in relation to workforce and population – emerged as important topic. The workshop identified a number of overall drivers and the primary barriers to the recruitment of labour. This chapter further maps some of the factors that may play a role in developing the attractiveness of Gotland in relation to attracting labour and increasing the population base.

In order to structure the assessment, the chapter uses the OECD territorial attractiveness framework to structure the findings of the workshop.

4.1 OECD: Territorial attractiveness as an approach

The attractiveness of regions, both in terms of population, labour force and investment, is a theme in many regions. In this regard, the OECD has developed an innovative and multidimensional approach to assessing regional attractiveness to the key target groups of investors, talent and visitors. The methodology comprises 50 indicators covering 14 dimensions, across 6 domains of attractiveness (economic attraction, connectedness, visitor appeal, natural environment, resident wellbeing, land use and housing).

The method is based on surveys, data studies, fact-finding missions, etc. with the aim of developing a valid method for mapping the attractiveness of regions. The aim of the assessment is not to rank regions but rather to provide an analysis of how they perform against each dimension.

The approach points to six domains (or themes) that summarize the factors that make a region attractive:

- Economic attractiveness (economy, innovation, labor market): Patent applications, employment, research and development (R&D), productivity and entrepreneurship
- Connectivity (transport, digitalization): Physical and digital infrastructure, from roads, transport systems to internet connection and digitalization.
- Visitors (tourism, cultural capital): Visitor numbers and tourism capacity and share of employment in cultural and creative industries.
- Natural environment (environment, natural capital): Both outdoor amenities and activities and physical environment
- Residents' well-being (social cohesion, health, education): Educational level, poverty rate etc.

[19] OECD: Doing green things: skills, reallocation, and the green transition. 2023
[20] Visby, Gotland on November 8, 2024

- Land use and housing (land, housing): Access to housing and housing affordability.

The themes and related dimensions are illustrated in this compass.

Figure 13: Compass with fourteen dimensions representing six domains of territorial attractiveness towards three core targets: investor, talent and visitors[21].

Source: OECD, Rethinking Regional Attractiveness in the new Global Environment

For the purpose of this analysis, we look into specifically those factors which focus on talent attraction and retention. Analysis shows that key factors in attracting talent are availability of affordable housing, access to fast internet are and education[22]. This being said it is important that any strategy for attracting and retaining workers is place-based and focused on the target talent group – there is no size that fits all[23].

[21] Measuring the attractiveness of regions, OECD, Regional Development Papers No. 36. 2022
[22] Rethinking Regional Attractiveness in the New Global Environment, OECD, 2023
[23] Rethinking Regional Attractiveness in the New Global Environment, OECD, 2023

4.2 Drivers and barriers to attractiveness on Gotland

As mentioned above, the workshop conducted in the framework of this analysis, had a special focus on the labour market and on the development and attraction of competencies to Gotland. During the workshop, it became clear that the attractiveness of the region is expected to play a major role in solving future challenges related to the green transition, as an increasing demand for labour, including labour with special skills, is expected to be crucial to supporting the green transition. The attractiveness of Gotland for relocation and employment is therefore important, in order to be able to recruit labour for the new jobs that are expected as part of the green transition. The attractiveness is also important to keep and maintain labour force on the island.

As the previous analysis has shown, the population groups that grow on Gotland (see section 1) are not necessary those relevant for the labour market. Thus, it is expected that it may be necessary to attract international labour to secure skills and labour force for the green transition. It may therefore be relevant to investigate whether there is a basis for e.g. establishing an international school to increase Gotland's attractiveness to international labour.

A number of specific themes have been highlighted in connection with attracting new labour to Gotland:

- access to education, especially higher education,
- well-functioning public services (healthcare, public schools etc.),
- energy infrastructure (electricity grid)
- transport infrastructure (ports and airports). good and affordable traffic connections to the mainland (ferry and air connections),

The table below illustrates the major drivers and barriers for attracting qualified labour to Gotland which were discussed at the workshop. In the table, the drivers and barriers are divided into individual and more structural factors.

Table 13: Drivers and barriers for attracting labour to Gotland.

Individual factors that can attract labour to Gotland	**Individual** factors that may be barriers to attracting labour to Gotland
Better job opportunities in general (more jobs to choose from). Attractive job possibilities (potential for more interesting jobs) within green transition. Attractive environment (nature, landscape, cultural history) Dissemination of information about interesting employment opportunities on Gotland	Long travel time and high transportation costs to and from Gotland Relatively high housing prices and a general housing shortage on Gotland Higher personal income taxes than on the mainland
Structural factors that can attract labour to Gotland	Structural **factors** that may be barriers to attracting **labour** to Gotland
Infrastructure that supports commuting: Investment in better transport options between Gotland and the mainland Attractive educational opportunities, especially within continuous education.	Fewer opportunities to choose different jobs in the labour market, compared to the mainland Fewer educational opportunities compared to the mainland

Attractive housing possibilities (more interesting housing options than on the mainland).	

Source: JTP team on basis from the workshop on Gotland, November 8, 2024.

Region Gotland has recognized the need to increase relocation on Gotland and attract additional labour force. In 2024[24], the region launched the Relocation Gotland program to promote a positive population development and ensure the supply of qualified labour.

The program contains a number of different strategies and initiatives that are intended to support the goal of more residents and a larger workforce. The initiatives include a systematic information effort for newcomers, a digital service platform for newcomers, strengthening opportunities for work, studies and good social relations on Gotland.

In addition, the program focuses on increasing knowledge of the workforce's decisions regarding relocation (what motivates the workforce's decisions to relocate), on efficient and affordable transport solutions and on Gotland's competition for labour with other Swedish regions.

[24] Relocation Gotland, project note. Region Gotland, June 2024,

5 Recommendations for possible actions

The analysis indicates that the green transition of the cement and mineral industry on Gotland will lead to an increased demand for labour across several sectors and industries on the island, and that recruitment challenges may arise for certain types of specialists and competencies in the coming years. It is essential to initiate measures that can address the anticipated challenges in the labour market.

However, some uncertainty has emerged regarding the extent of investments in the green transition on and around Gotland. In November 2024, the Swedish government decided to halt further efforts to establish 13 offshore wind farms that were under planning in the Baltic Sea, several of which were intended for the waters around Gotland. This may, in the short term, reduce the demand for labour for the green transition.

The demand for labour is expected to be particularly high until 2032, when many of the green transition projects are anticipated to be completed, according to current plans. However, a caveat must be noted regarding the offshore wind farms that are currently on hold. Following the construction phase, the demand for labour to operate these projects will diminish, but their lasting impact on the local labour market is anticipated.

The developments related to the green transition will occur at a time when Gotland is expecting overall employment growth in the labour market, even without the green transition. Recruitment problems have already been observed in several key sectors and industries—both public and private—and there may be further shortages of qualified labour on Gotland in the coming years.

The labour market on Gotland is relatively small, and long travel times combined with high travel costs create unique challenges for recruitment in an increasing number of jobs. Therefore, it is important to consider how to best utilize the available resources in the labour market for the benefit of development on Gotland, as well as how to adapt effectively to the evolving demand for labour in the coming years. In other words, some growth opportunities that arise should be pursued by local stakeholders, while other opportunities could be left to entities from the mainland.

In light of the expected developments, there may be a need to implement a number of concrete initiatives. The following actions are recommended:

- **Maintain Focus on Ensuring a Sustainable Energy Supply:** The decision to halt the construction of offshore wind farms in the waters surrounding Gotland may pose a risk to the green transition on the island. A secure and sustainable energy supply is essential for implementing the green transition in the cement and mineral industries. At the same time, efforts should be directed toward strengthening and expanding the local energy grid to ensure reliable electricity distribution on Gotland. Therefore, it is crucial to maintain close dialogue with central authorities involved in energy planning in Sweden to ensure that the energy supply for these projects receives significant attention.

- **Develop a Strategy to Pursue Relevant Opportunities:** There is a need for a regional strategy that encourages local involvement in upcoming green transition projects on Gotland. The companies and workforce on the island do not possess unlimited resources to undertake the tasks associated with the green transition. During the construction phase of these projects, there will be numerous contracts

that, while extensive and specialized, will be relatively short-term. This type of work will primarily be relevant to a few companies on Gotland, including those in the construction industry. The strategy should assess in which areas local businesses and the workforce can contribute to future investments and how Gotland can maximize the benefits of the expected developments. It is crucial to consider how potential tasks within the green transition can support long-term development for Gotland. Stakeholders should actively pursue opportunities that help build competencies in sustainability, particularly in sustainable industrial production and renewable energy supply. The focus should be on creating new and attractive job opportunities, fostering a sustainable business community, and attracting new residents to the island.

- **Systematic Monitoring of Potential Projects:** Plans for future projects on Gotland remain uncertain, and it is likely that some announced projects will not be implemented. For example, the recent decision to halt the development of offshore wind farms near Gotland illustrates this uncertainty. Therefore, a monitoring system should be established to keep stakeholders on Gotland continuously informed about the status of projects, including schedules, scopes, and key decisions.

- **Establish a Systematic Dialogue with Developers/Project Owners:** It is recommended to establish a dialogue with the owners/operators of future projects on and around Gotland. The purpose of this dialogue should be to ensure that initiatives can be launched regarding training and recruitment for the labour force that will be in demand during the green transition. This dialogue should facilitate understanding of project owners' needs and plans during the operational phase, specifically regarding their expectations for local jobs and required skills. It should also provide insight into plans for attracting labour from outside Gotland, highlighting the need for adequate housing and services for the workforce. Both monitoring of the projects and systematic dialogue will require resources; therefore, it is advisable to allocate resources for these tasks and to anchor responsibilities within existing organizations.

- **Education and Training:** The green transition will necessitate new skills in the labour market. Not all necessary education and training can be provided on Gotland. A balance must be struck between offering education locally and collaborating with external educational institutions. This collaboration could involve transporting specialized trainers to the island to provide specific skills to the local workforce or establishing educational opportunities on the mainland that are tailored to the needs arising from the green transition. It will be essential to investigate specific possibilities for strengthening cooperation with educational institutions on the mainland.

- **Focus on Attracting and Retaining Labor:** Positive population growth and the ability to attract people to Gotland are prerequisites for expanding the labour force on the island. Region Gotland has already initiated efforts to attract more residents. However, this analysis has identified barriers to drawing immigrants and labour to the island, including a lack of housing, high transportation costs to and from the island, and relatively high taxes. Moving to Gotland is a significant decision that can impact family life, educational opportunities, and career prospects. Therefore,

it is important to ensure that the overall living conditions on Gotland are made appealing. Efforts should be made to explore ways to reduce or eliminate these barriers.

6 List of sources

- Vårt Gotland 2040 | Region Gotland
- OECD Territorial Reviews: Gotland, Sweden | en | OECD
- EU DG REGIO - Leveraging industrial symbiosis for a just transition A case study of the Port of Aalborg in North Jutland, DK
- EEA - Anticipating and managing the impact of change The transition to a climate-neutral economy: Exploring the socioeconomic impact
- COWI - Energiø Bornholm – Erhvervspotentialer (Desk Study Rapport)
- COWI - Beskæftigelseseffekter Af Energiø Bornholm (Analyserapport)
- Just Transition Fund National programme 2021-2027
- Regionala utbildnings- och arbetsmarknadsprognoser - Prognosresultat för länet år 2035
- Sammanfattning av regionala utbildnings- och arbetsmarknadsprognoser - Med sikte på år 2035
- MDPI - Towards a Territorially Just Climate Transition—Assessing the Swedish EU Territorial Just Transition Plan Development Process

7 List of stakeholders interviewed for the report

The list below is a preliminary list of stakeholders who have been interviewed for this report.

Name	Company / organisation	Role in project for Green Transition og Gotland
Joanna Marchlewska Moberg	EOLUS	Energy Company, Offshore wind
Åsa Dyberg	Freja Offshore	Energy Company, Offshore wind
Matilda Pettersson	GEAB Elnät	Grid Company, Gotland
Kalle Blomberg	GEAB Elnät	Grid Company, Gotland
Dick Engqvist	GETTAB	Subcontractor, electrical services, Gotland
Henry Hammarström	Gotland Tech Development	Development of green fuels for ferries
Andreas Wickman	GVP Vind	Organisation for windpower on Gotland
Albin Carlén	Heidelberg Materials	Cement manufacturer on Gotland
Jenny Sander	Heidelberg Materials	Cement manufacturer on Gotland
Matilda Hoffstedt	Heidelberg Materials	Mineral industry on Gotland
Ola Thuresson	Nordkalk	Mineral industry on Gotland
Lise Toll	OX2	Energy Company, Offshore wind
Christian Hegardt	Region Gotland	Planning authority on Gotland
Annina Hästö	RWE	Energy Company, Offshore wind
Dan Sandros	SR Energy	Energy Company, Onshore wind
Sebastian Zartmann	SR Energy	Energy Company, Onshore wind