BASELINE ANALYSIS OF CIRCULAR JOBS

IN SWISS CANTONS

CIRCLE ECONOMY

Circular Economy Switzerland

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CIRCLE ECONOMY

Circle Economy is a global impact organisation with an international team of passionate experts based in Amsterdam. We empower businesses, cities and nations with practical and scalable solutions to put the circular economy into action. Our vision is an economic system that ensures the planet and all people can thrive. To avoid climate breakdown, our goal is to double global circularity by 2032.

The Circle Cities Programme guides cities and regions on their journey from a linear to circular economy, using data to inform multi-stakeholder decision making to accelerate the transition. With the Circular Jobs Initiative, we help local stakeholders to measure local employment in circular economy activities and which circular economy activities are best suited to the local economy and labour market.

Circular Economy Switzerland

Circular Economy Switzerland pursues a vision of a Switzerland that has completed the transition from a linear economy to a circular economy. By connecting enthusiastic circular economy actors from the private sector, civil society, politics and administration, and by promoting cooperation and knowledge exchange across all sectors and fields, Circular Economy Switzerland acts as an impulse generator for a new, Switzerland-wide circular economy movement.

The report *Circular Jobs in Swiss Cantons* is carried out within the framework of the project 'Strengthening the discourse on circular economy in Switzerland'.

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BEHIND THE COVER

The city of Zürich

Credit: Henrique Ferreira, www.unsplash.com

1. INTRODUCTION

National and local governments have a key role to play in achieving a sustainable future for people and the planet. Having benefited greatly from globalisation, countries like Switzerland have a responsibility to not only maximise benefits for their own economy as they work towards this future, but also to mitigate how their environmental and socioeconomic policies impact the rest of the world. An increasing number of governments are turning to the circular economy as a way to make better use of our planet's dwindling reserves and help society respond to the challenges of climate change. In providing an alternative to the current linear 'take-make-waste' economy, it seeks to extract the maximum value from resources that are already in use in society and keep materials in circulation for as long as possible through processes like reuse, repair, remanufacturing and recycling. The circular economy is an approach that allows us to live within the means of the planet while still providing for the global population, through strategies that fulfil societal needs with fewer materials and emissions.

Cities and regions are important drivers of the circular economy. They are hubs of innovation and employment, as well as consumption and waste generation, producing over 80% of the world's GDP.[1] They are where the circular economy is put to action, through initiatives that help cut greenhouse gas (GHG) emissions, generate savings on landfill and other waste management costs, and bring about enterprise, jobs and local value creation. Switzerlands' cities and cantons are no different. Being a federal state, cantons and municipalities in Switzerland enjoy considerable discretionary powers. Moreover, almost three-quarters of the Swiss population live in urban areas, where around 80% of the country's economic activity is concentrated.[2]

Circular economy adoption across cities and cantons will hinge on their workforces. Scaling the adoption of circular economy strategies within local governments, businesses and communities will require changes in the way stakeholders operate and collaborate, causing job roles at all levels of the workforce to shift. This shift will be made possible by leveraging the know-how of the existing workforce in addition to a general upskilling and reskilling as a result of task diversification and technological advancements.[3]

Knowledge provides opportunities. To tap into the opportunities that circularity presents Switzerland's cantons, it is vital to first understand how many and which jobs are already contributing to the circular economy locally. To explore this, Circular Economy Switzerland and Circle Economy collaborated on the first baseline assessment of circular jobs in Switzerland. This report presents the results of this study, first illustrating the national picture, before diving into circular jobs in five Swiss cantons: Zurich, Bern, Basel and Vaud. These findings have been validated by local stakeholders from each canton. Finally, we outline how these insights can be harnessed to strengthen local jobs whilst contributing to a local and global economy that uses fewer materials and emissions.

You can also explore the results of this study through an interactive map on the Circular Jobs Monitor, an online tool powered by Circle Economy that gathers and displays the amount and type of jobs that are part of the circular economy across global regions using a methodology developed with the United Nations Environment Programme.

2. JOBS IN THE CIRCULAR ECONOMY

A circular job is any occupation that directly involves or indirectly supports one of the **strategies of the circular economy**. We differentiate between three types of circular jobs: core, enabling and indirectly circular jobs.

CORE CIRCULAR JOBS

Are all jobs that ensure the closure of raw material cycles, including jobs in repair, renewable energy, waste and resource management. They form the core of the circular economy.

PRIORITISE REGENERATIVE RESOURCES

Ensure renewable, reusable, non-toxic resources are utilised as materials and energy in an efficient way.

Agronomic advisors support healthy soil nourishment with organic fertiliser from composted manure and crop remnants. They combine strong interpersonal skills with ecological knowledge.

STRETCH THE LIFETIME

While resources are in-use, maintain, repair and upgrade them to maximise their lifetime and give them a second life through take back strategies when applicable.

Repair technicians repair appliances, machines or vehicles. They possess strong technical and manual skills which can be acquired through a formal and informal education and training.

USE WASTE AS A RESOURCE

While resources are in-use, maintain, repair and upgrade them to maximise their lifetime and give them a second life through take back strategies when applicable.

Repair technicians repair appliances, machines or vehicles. They possess strong technical and manual skills which can be acquired through a formal and informal education and training.

ENABLING CIRCULAR JOBS

Are jobs that remove barriers for and enable the acceleration and upscaling of core circular activities, including jobs that arise in leasing, education, design and digital technology. They form the supporting shell of the circular economy.

DESIGN FOR THE FUTURE

Adopt a systemic perspective during the design process, to employ the right materials for appropriate lifetime and extended future use.

Circular equipment engineers design products to enable parts and resource recovery after the product's use phase. They excel in complex problem solving on a technical level designs for the future.

DESIGN FOR THE FUTURE

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RETHINK THE BUSINESS MODEL

Consider opportunities to create greater value and align incentives through business models that build on the interaction between products and services.

Demand planners oversee supply and demand to make refurbishment a profitable business model. This role requires logical thinking and reasoning.

INCORPORATE DIGITAL TECHNOLOGY

Track and optimise resource use and strengthen connections between supply-chain actors through digital, online platforms and technologies.

Building information managers maintain data on construction components so as to keep track of these physical assets. They understand how to integrate and interpret virtual information management systems.

TEAM UP TO CREATE JOINT VALUE

Work together throughout the supply chain, internally within the organisation and with the public sector to increase transparency and create shared value.

Procurement professionals stimulate the demand for secondary materials and discern and connect new suppliers in order to do so. This profile points to the need for entrepreneurial, interpersonal skills.

STRENGTHEN AND ADVANCE KNOWLEDGE

Develop research, structure knowledge, encourage innovation networks and disseminate findings with integrity.

Teachers transfer knowledge and skills to the current and future workforce so as to equip workers with skills for circular economy strategies.

INDIRECT CIRCULAR JOBS

Examples of indirectly circular jobs are:

- **The courier,** who uses and maintains a fleet of secondhand bikes to bring packages to and from consumers as part of a reverse logistics scheme;
- **The bank,** which uses repair services to maintain the electrical equipment used in its day to day operations;
- **The farmer,** who utilises renewable energy in the production of their agricultural products.

Circular jobs as a proxy for circular activity

To drive the adoption of circular economy interventions, a systematic, data-driven approach is crucial for setting ambitious targets and tracking progress towards them. Correspondingly, recent years have shown an increasing interest in metrics and indicators that can provide a framework for measuring progress towards the circular economy and the impact of circular economy interventions.

By measuring circular jobs, we can create a proxy indicator of current circular activity across sectors. Measuring current activity also provides an indication of areas and ways in which circular activity could be increased. You can read more about the Circular Jobs Metric, and the methodology used in this report, here and here.

How to interpret the results

The jobs methodology relies on the classification of economic sectors into core, enabling and indirect sectors, based on the Key Elements Framework. We used NOGA codes to classify economic sectors based on these three categories. For each of these categories, we estimate how many jobs can be considered circular: for example, there are 105,882 core circular jobs in Switzerland. We then look at the sectors that employ the most people in each of these three categories: for example, about 10% of jobs in core sectors are related to waste management. Since not all of these jobs can be considered circular, we also highlight which jobs could serve a circular rather than linear economy: for example, by increasing the share of jobs in waste management, especially those that deal with material recovery.

Limitations to the methodology

Standard classifications, such as NOGA/NACE or ISIS, categorise workers according to their companies' main activity, and therefore do not account for secondary activities. Bottom-up corrections for individual sectors in employment data can mitigate this, where possible.

The Circular Jobs Methodology relies on national Input-Output Tables (IOT) to quantify the circular activity occurring within each sector. This is done through a set of rules that aims to model the interactions between core, enabling and indirect sectors. However, this approach might fail to capture a substantial share and therefore underestimate the circular practices performed on the micro-level.

3. THE CIRCULAR ECONOMY AND JOBS IN SWITZERLAND

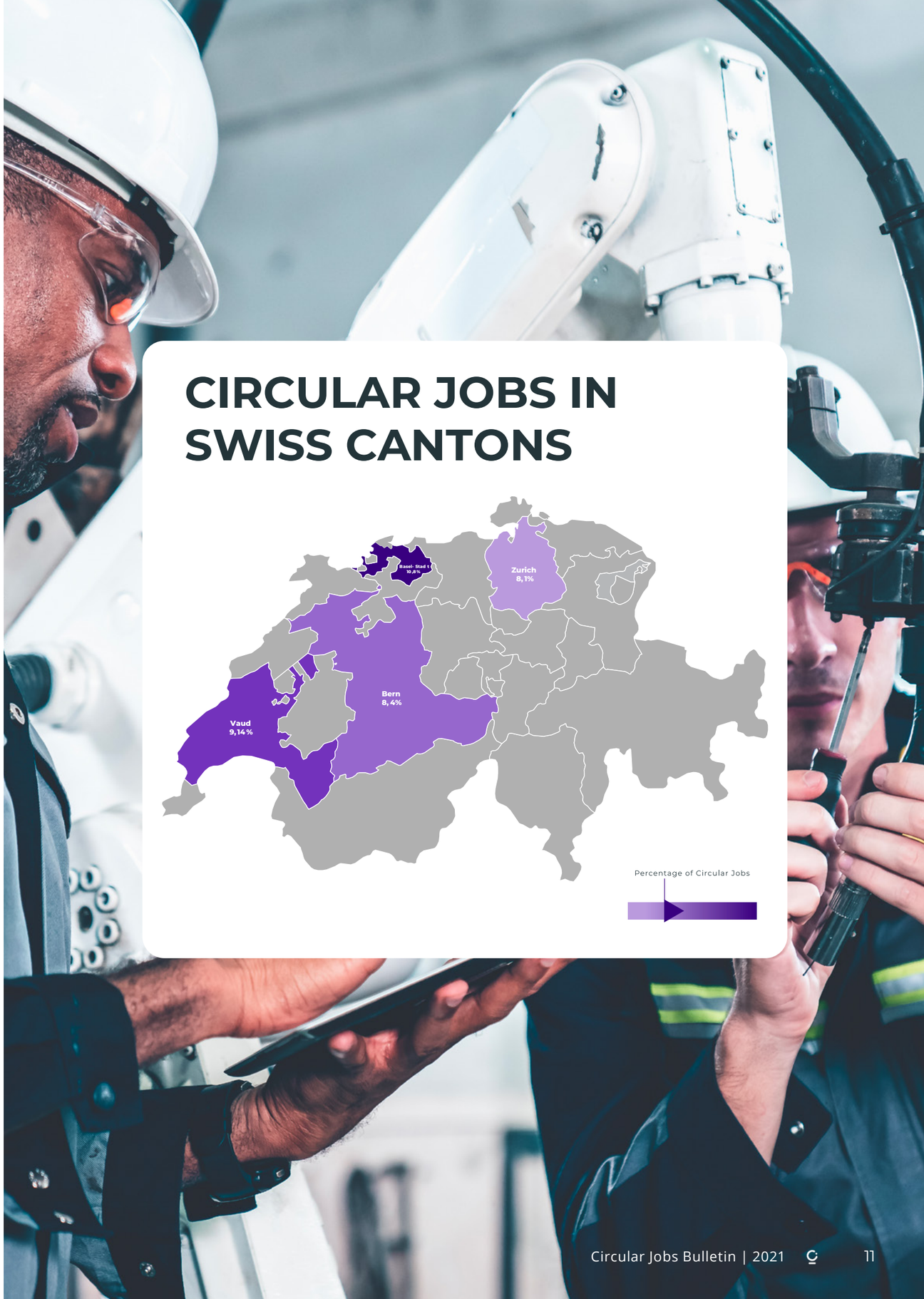
Positioned in the heart of Europe, Switzerland lives up to its reputation as a stable country with one of the most competitive economies in the world. High-quality education, reliable infrastructure, political stability and close integration with other countries form the basis of its competitive economy.

With the second highest GDP per capita in the world—74% of which is generated by the services sector and 25% by industry—the Swiss economy is highly developed.[4] Small and medium-sized enterprises (SMEs) account for over 98% of all firms in Switzerland.[5] The machine, electrical engineering and metals industry is the largest industrial employer in Switzerland and one of the country's leading exports.[6] Although agriculture contributes to less than 1% of total GDP, the national government has several measures in place to support the sector. As a result, 65% of the country's demand for food is met by local production.

Overall, Switzerland's labour market reflects this stability. Unemployment has remained below 5%, and real earnings have been growing at a rate of about 0.5% per year since 2000. This success comes despite a massive expansion of the labour force, which has increased by 23% since 2000, the Great Recession, the appreciation of the local currency and, more recently, the covid-19 crisis.[7] Switzerland has a highly skilled labour force, most of which is employed in the services sector.

The high GDP per capita, employment rates and productivity levels do, however, translate to resource-intensive consumption patterns. Raw material consumption is among the highest of OECD countries, and with over 90 million tonnes of waste (700 kilograms per capita) produced per year, Switzerland scores among the worst countries in the world.[8]

The circular economy provides an opportunity for Switzerland to achieve sustainable patterns of production and consumption and contribute towards limiting the global impacts of climate change. Throughout the country, stakeholders and businesses in cantons and regions are embracing the potential of the circular economy to not only drive environmentally-sustainable development, but to also push for an inclusive society and decent jobs. You can read examples of their initiatives throughout this report and on Circle Economy's Knowledge Hub.



4. CIRCULAR JOBS IN SWITZERLAND

9.1% of Switzerland's 5.3 million jobs already contribute to the circular economy. This is in line with a recent survey supported by Circular Economy Switzerland, which found that around 10% of companies have started to implement circular business models[9]. Although the level of circular employment is relatively high when compared to other countries in Europe, which fall between 5% and 10%,[10] this indicator suggests that Switzerland is still at the beginning of its circular transition. For example, we've found that several cities in Europe like Copenhagen already have 20% of their workforce contributing to circular economy activities.[11]

Swiss companies are switching to circular business models because they open up opportunities for them to future-proof their businesses and operate more sustainably with greater competitiveness—all while moving away from the linear risks associated with using scarce and non-renewable resources, and failing to innovate or adapt.[12]

Potential for circular jobs across core, enabling and indirect sectors:

CORE JOBS

22% of total circular jobs in Switzerland are **core circular jobs** (105,882). This represents 2% of total employment in Switzerland. About 2% of core jobs are related to electricity generation from renewable sources. In 2019, over 75% of power in Switzerland came from renewable sources—mostly from large-scale hydropower plants—with the remaining proportion coming from oil, natural gas and nuclear power.[13] [14] About 10% of core jobs are in waste management. Most of this is related to activities such as water purification, linked to the country's role as the 'water reservoir' of Europe.[15] However, overall employment in this sector is relatively low compared to other countries:[16] while Switzerland is considered a world champion in recycling, it still exports a significant share of its hazardous waste,[17] and the remaining waste is largely incinerated to produce energy. These elements could explain the low share of circular jobs in the waste management sector, given that incineration is far less labour-intensive than recycling.[18] Finally, the majority of core jobs (88%) come from keeping resources in use: maintaining, repairing and upgrading them to maximise their lifetimes. This is driven mainly by the mechanical, electrical and metal industry (MEM), one of the biggest employers in the country. Moreover, the federal government is actively supporting measures aimed at increasing the useful life of products, as well as fiscal incentives and other measures to set the right impulse in this direction (for example, VAT exemptions for repair and maintenance).[19] Around 19% of companies in the country have already adopted strategies to extend the service life of products through repairs and maintenance.[20]

ENABLING JOBS

6% of total circular jobs in Switzerland are **enabling circular jobs** (30,287 jobs). This represents 0.6% of total employment in Switzerland, suggesting that sectors like education, design and digital technology supply a relatively small share of their services to core areas of the Swiss circular economy, such as waste management, repair and the production of renewable energy. Enabling sectors could remove barriers for core jobs, accelerating and upscaling the transition to a circular economy, as they currently support more linear practices with high material and emission footprints.

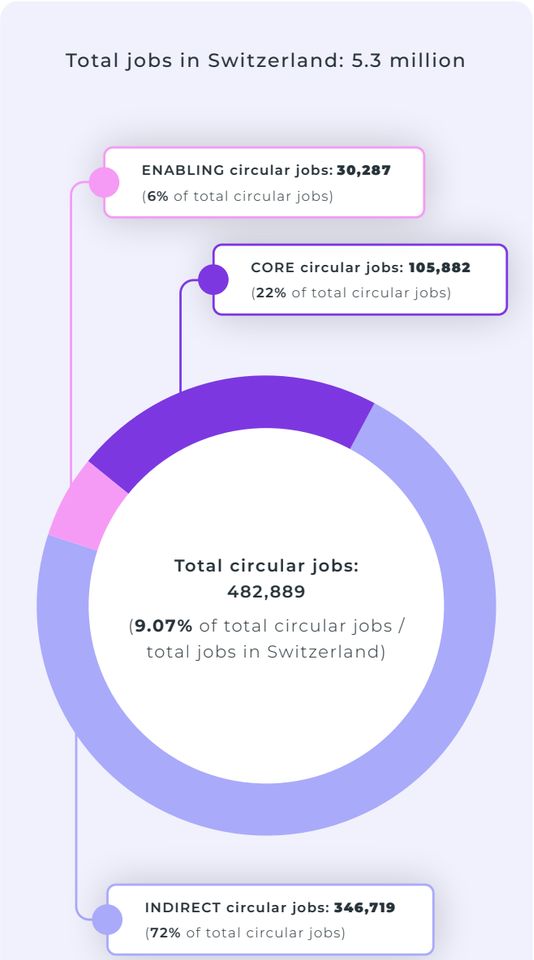
Design-related jobs, such as architecture, engineering consultancy and fashion design, constitute the largest share of enabling jobs (39%). They are followed by jobs that rethink linear business models (20%): product leasing and renting, renting of construction and demolition equipment and second-hand sales, for example, or jobs that shape innovative models for optimised freight transport and logistics, which could be leveraged to increase circularity.[21]

INDIRECT JOBS

72% of total circular jobs in Switzerland are **indirect circular jobs** (346,719 jobs). This represents 6.5% of total employment in Switzerland. These jobs are in sectors that do not play a direct role in furthering the transition to the circular economy, but can still adopt circular strategies. In Switzerland, these jobs are concentrated in service sectors, including in wholesale and retail, professional and scientific services and human health and social care, reflecting the fact that about 75% of jobs in the country belong to this category.

In general, indirect sectors' high circularity score can be explained by the extensive use of preservation services, such as repair and maintenance. However, the share of secondary materials from the recycling sector is certainly low and, along with the use of imports, contributes to lower circularity.

Jobs in agriculture and construction display a very low degree of circularity, meaning that these sectors do not interact heavily with core circular sectors, like waste management, renewable energy and repair. Although the vast majority of Swiss agricultural production is destined for local consumption, Switzerland is dependent on substantial imports and still heavily focuses on livestock production, while only about 8% of food is grown organically.[22] However, it is important to note that some of these sectors' circular activities may be underrepresented in this analysis. For example, we only consider jobs in the construction sector that are indirectly created by the circular economy, due to the way activities are classified across sectors. Circular activities such as waste management or repair could potentially be performed within the sectors themselves, or informally with other professionals. Construction and demolition waste can be recycled on-site or machinery can be repaired in-house, for example.



CIRCULAR JOBS IN BERN

Bern is the second-largest canton by both surface area and population. With around one million inhabitants, of which about 15% are foreign nationals, it has the second largest workforce in Switzerland after Zurich and unemployment across all sectors is significantly lower than the national average. Therefore, businesses generally benefit from a pool of highly well-trained and often multilingual workers.[23] The canton hosts the country's capital, Bern, and is home to both French- and German-speaking communities. Along with Zurich, Bern is one of the largest industrial cantons and has historically been one of Switzerland's key industrial and high-tech hubs, with highly specialised SMEs in industries such as watchmaking, healthcare, food, telecommunication and the precision industry forming the backbone of the canton's economy.[24] In fact, SMEs account for around two-thirds of all Bernese jobs.[25] [26] Agriculture and forestry are also prominent in this canton: one in five Swiss farms is located in Bern. These sectors employ over 17% of the total workforce, although these figures have declined in recent years.[27]

Of the nearly 650,000 jobs in Bern, the second largest workforce in the country, 8.4% are circular (54,547 jobs). This is below the national average, mainly because a larger share of jobs in this caton pertain to agriculture and forestry, which display a low degree of circularity as they rely more on primary resource extraction than use of secondary materials.

Potential for circular jobs across core, enabling and indirect sectors:

CORE JOBS

27% of total circular jobs in Bern are **core circular jobs** (14,473), representing 2% of total employment. In line with the national profile, 91% of these core jobs focus on preserving products already in use, through activities like repair and maintenance. Conversely, only 1% of core jobs come from renewable energy production and 8% from the waste sector. Renewable energy in the canton is mainly hydropower, solar and natural gas. The last nuclear power plant in the canton was permanently switched off in 2019.[28] Waste management shows both lower levels of employment and a lower degree of circularity than one might expect: waste treatment is largely just incineration.[29] Bern only has one recycling and sorting plant, equipped to process 50,000 tonnes of waste per year. 85% of this can be recycled, while the rest ends up in incinerators.[30] Plastic recycling capacity is also limited and as a result is treated outside of the canton.

ENABLING JOBS

6% of total circular jobs in Bern are **enabling circular jobs** (3,262), representing 0.5% of total employment. In line with the national picture, circular activity in Bern's enabling sectors is low, and its potential as an enabler of core circular sectors is currently underexploited. Compared to the national average, more jobs are focused on the 'Knowledge' element (25%), a significant proportion of which are in technical and vocational secondary education. These could be leveraged to upskill workers towards more circular activities.[31] A significant portion of enabling jobs are also found around the 'Rethink' element (17%), driven by the many SMEs involved in innovation and new business models. Finally, some jobs related to the 'Collaborate' element (7%), reflecting public sector support for core circular jobs. Bern is actively working towards implementation of the *EU Green Deal* and its own *Circular Economy Master Plan*,[32] and has already developed an innovation strategy to support sustainable SMEs to adapt and innovate.[33] 'Design' and 'Digital technology' could be better leveraged to, for example, encourage circular design practices in architecture and the creative industry. Bern University of Applied Sciences is putting emphasis on the skills for circular material management, with its first circular economy programme due to start in September 2022.[34]

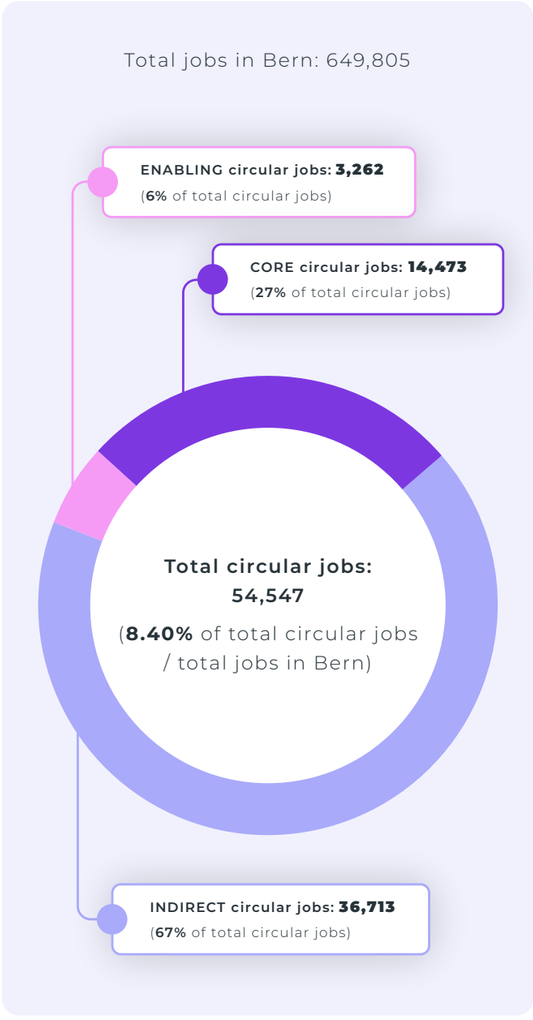
INDIRECT JOBS

67% of total circular jobs in Bern are **indirect circular jobs** (36,713), representing 5.7% of total employment. The agriculture sector employs the most people in this category and shows a low degree of circularity. This is particularly due to dairy farming activities, which employ around 51,000 people, but has a low circularity score, under-exploiting core sectors such as renewable energy, waste management and repair. Increasing the circularity of the dairy industry by maximising land productivity and leveraging biological and technological processes could help close nutrient, water, carbon and waste cycles, while promoting biodiversity, optimising land use and safeguarding farmers' income.[35]

Case Studies

The power of SMEs and innovative circular business models is already showing in Bern:

1. Business case: TEIL, the open wardrobe in Bern
2. Business case: Gmüesgarten: solving the food waste problem
3. Business case: ReCIRCLE – Tackling the plastic waste in the food sector



CIRCULAR JOBS IN ZURICH

The canton of Zurich is the most highly and densely populated canton in Switzerland, with over 1.5 million inhabitants. Its population is growing yearly, mainly due to migration, largely coming from Germany and Italy. The canton also has the highest average wage and one of the strongest economies in the country (contributing to over one fifth of the country's GDP).[36] Its sectoral profile is composed mostly of service companies, which represent roughly 85% of the local businesses. Financial services in Zurich equate to 18% of local GDP and are one of the largest employers, followed by healthcare, education, wholesale and retail trade. With more than 8,000 startups founded in 2019 alone and home to numerous multinational companies, Zurich is considered an innovation hub.

Zurich has the largest share of jobs in the country (19%), with a total workforce of over 1 million people, hosting around 120,000 companies. Only 8.1% of jobs are circular (below the national average), mainly due to a low level of interaction between core and enabling sectors.

Potential for circular jobs across core, enabling and indirect sectors:

CORE JOBS

24% of total circular jobs in Zurich are core circular jobs (13,542), representing 2.1% of total employment. Despite having the largest workforce in Switzerland, little over 2% of jobs in Zurich are classified as core circular jobs. Similar to Bern, 'Stretch lifetime' activities are by far the most prominent in this canton (82% of core jobs). Only 1% of core jobs comes from renewable energy production, falling well below the national average. There are no major power plants in Zurich, and the energy supply comes from other cantons, mostly (80%) from non-renewable energy sources, such as natural gas and oil.[37] Conversely, the share of jobs in the waste sector is significantly higher than in other cantons (17%): most incinerators in the country are concentrated in the area of Zurich,[38] as well as the largest wastewater treatment facility in Switzerland,[39] and the recycling rate is higher in Zurich than in other cantons. This is mainly due to the waste management advancements in the construction sector. In 2004, construction and demolition waste already accounted for almost two-thirds of the total waste in the country, of which about 80% was recycled. In the Canton of Zurich this was about 90%.[40] Still, wasteful production and consumption patterns in the canton have a negative impact on the environment. Pollutants from waste are found in almost 2% of the canton's area:[41] more could be done to prevent waste from entering the ground and subsoil.

ENABLING JOBS

6% of total circular jobs in Zurich are enabling circular jobs (5,514), representing 0.1% of total employment. Although enabling sectors in Zurich reveal a low degree of circularity, there are more jobs related to the 'Knowledge' (33%) and 'Collaborate' (12%) elements than the national average, which could be leveraged to boost circular activity. Research on the circular economy is evolving rapidly in the canton, and could provide circular solutions and new scalable ways to recycle products for many important industries, such as the building sector or consumer goods. The public sector can play a key role in further supporting circular activities. The City of Zurich is the first Swiss city to sign the Circular Cities Declaration, including the introduction of targets and strategies for the circular economy, raising awareness for circular measures, and involving local actors and integrating them into public procurement.[42] Conversely, jobs in 'Rethink', 'Design' and 'Digital' show very low degrees of circularity and interaction with core circular sectors. This means that engineers and designers still need to interact more with core circular sectors than they do today—especially in the construction sector, given the good end-of-life recycling. A focus on beginning-of-pipe solutions, such as design for disassembly or product-as-services business models, could be key to upscaling circularity within this sector.

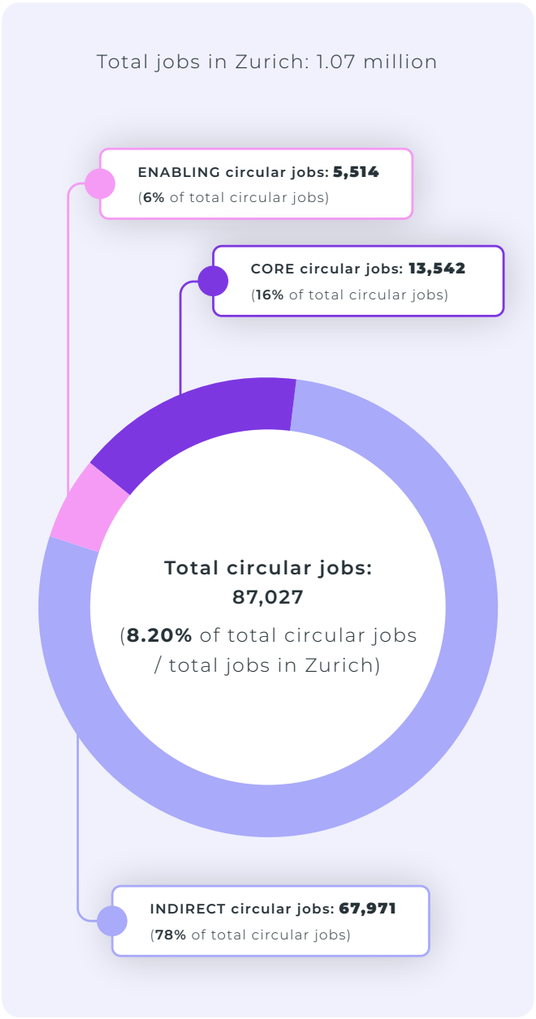
INDIRECT JOBS

78% of total circular jobs in Zurich are indirect circular jobs (67,971), representing 7.8% of total employment Zurich is home to the largest financial centre in the country, which generates 45% of the sector's national economic value added. The great importance of this sector makes it a key indirect enabler of the transition.[43] Financing the circular economy could increase the resilience of the local economy through business model diversification, decoupling economic growth from resource use and environmental impacts.[44] Healthcare and social work and professional, scientific and technical services are also prominent sectors in this category, in line with the national profile.

Case Studies

Best practices in core sector such as waste management are widespread in the canton:

1. Policy case: Transport-based recycling in Zurich
2. Business case: Closing the building material cycle
3. Business case: Producing climate-friendly cement through solar energy



CIRCULAR JOBS IN BASEL-STADT

The canton of Basel-Stadt is one of the smallest in terms of area and one of the most densely populated. Located near the French and German borders, it is a key point from which to access the European market, well connected by air, water and land transportation. The largest of its three main municipalities, Basel, is also Switzerland's third-largest town after Geneva and Zurich. The city is considered the cultural capital of the country, with a dynamic economic centre and research stronghold. With little over 190,000 jobs, the canton is considered one of Europe's top locations for life sciences, contributing to over 44% of national gross value added (GVA), although the sector only employs about 10% of the population.[45] The healthcare industry is also prominent in the area. Due to its strategic location, the canton's pharmaceutical products account for around 83% of exports and 70% of imports.[46]

With a total workforce of almost 192,500 people, Basel shows the highest level of circularity compared to other cantons explored in this report and other major cities in Europe:[47] 10.8%, equivalent to 20,697 jobs (1.6 percentage points above the national average). Core sectors are the driving force behind this:closely situated sectors frequently interact with each other, and many jobs relate to core circular activities such as waste management.

Potential circular jobs across core, enabling and indirect sectors:

CORE JOBS

23% of total circular jobs in Basel are **core circular jobs** (4,730), representing 2.5% of total employment in the canton. Like with all cantons, most of these are in 'Stretch lifetime' activities (81% of core jobs). Interestingly, in Basel, these activities are especially concentrated around maintenance of motor vehicles, as the cantonis home to Jet Aviation, a provider of business aviation services. Although the company does heavily focus on maintenance and repair, luxury business aviation services cannot be considered circular—and their presence may positively skew the results of this analysis. Still, the canton of Basel also displays one of the highest shares of core jobs related to the 'Regenerate' element (9% of core jobs). Almost 350 out of 650 energy-production-jobs contribute to the production of renewable energy. With aims of reaching carbon neutrality by 2040, the city of Basel and the surrounding Basel-Stadt sources 100% of its electricity from renewables, primarily from hydropower, with 10% from wind and smaller contributions from biomass and solar.[48] Finally, 10% of core jobs relate to waste management, of which 75% are within 'Recovery of sorted materials', revealing a big opportunity for activities such as the re-processing of sorted materials into secondary resources. The 'Purification of water' comes second, likely because the canton once housed many chemical industries that have now moved into the pharmaceutical sector. IWB—Switzerland's leading renewable energy service provider and the main company for energy, water and waste—is one of the biggest employers in the area, and has adopted strict environmental standards over recent years: it could push to advance circularity in core jobs.

ENABLING JOBS

5% of total circular jobs in the canton are e**nabling circular jobs** (1,074), representing 0.6% of total employment in the canton. The majority of enabling jobs relate to 'Rethink' element (54% of enabling jobs), mainly due to many activities such as the renting and leasing of machinery, sharing of transportation vehicles, and other activities that prioritise access over ownership. Business and innovation are greatly supported in the region[49] and often interact with one another. The Smart City Lab is a successful example: a space that connects partners to test ideas, prototypes and services in areas like logistics and mobility. Interaction between enabling and core sectors in Basel is still low, however, as was the case for other cantons. Spaces like this could be crucial for upscaling circularity and shaping open innovation ecosystems based on a systematic user co-creation approach. Within this lab setting, it will be important to bring academia together with private, public and civil actors. Living labs can be the perfect place for innovative ideas borne from research to feed startups and explore circular economy solutions, connecting and setting up exchanges between already existing initiatives or developing new ones.

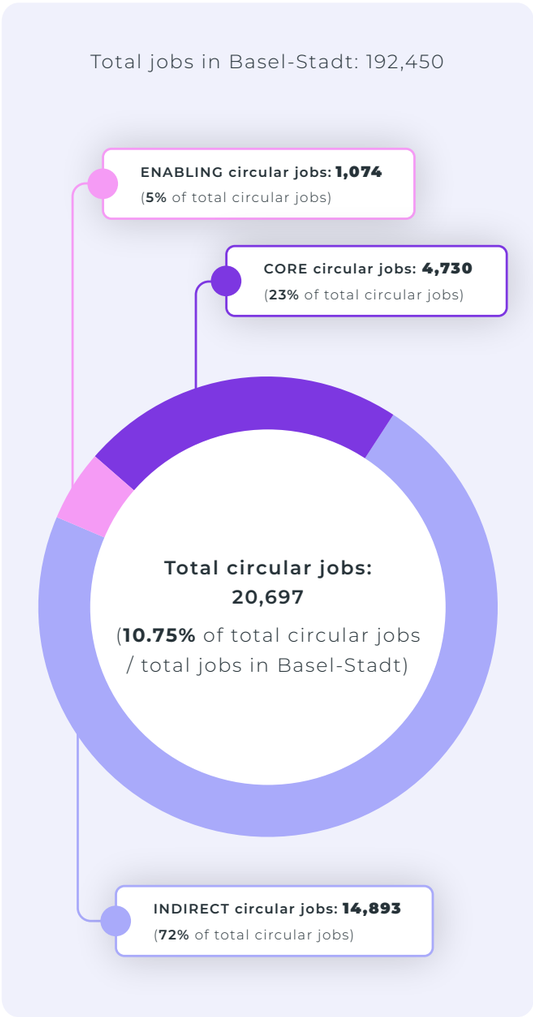
INDIRECT

72% of total circular jobs in Basel are **indirect circular jobs** (14,893), representing 7.7% of total employment. Basel has a strong manufacturing, wholesale and retail sector, encompassing more than 40% of jobs. The importance of retail in this job category emphasises the critical role retailers play in preventing waste generation. Reverse logistics operations, as well as take-back-schemes, repair and refurbishment services, could help improve the circularity of this sector, but must be matched by substantial changes in consumer behaviour.[50] Good circular activity found in the transportation sector, most likely fueled by Basel's commitment to sustainable mobility,[51] could also be leveraged.

Case Studies

Re-processing of sorted materials into secondary resources is becoming widespread across different businesses in Basel:

1. Business case: EarthColors
2. Business case: VYN, sneakers crafted to last
3. Business case: Recycled campervans for rent



CIRCULAR JOBS IN VAUD

Vaud is the third largest canton of the country by population and employment, and fourth by area. It has among the percentages of foreigners (30.5% of residents)[52] and it is well-known for its vineyards and tourism industry, driven by its capital Lausanne. Tourism represents 8% of total national employment,[53] but its labour market is still predominantly service-based and highly specialised in high-tech industries, commodities trading and business services. The canton has shown great economic dynamism in recent years, experiencing high growth in population.[54] It also houses over 2,000 high-tech companies, multinationals, and some of Europe's most prestigious research centres, working in life sciences, digital information technologies, nutrition and food, precision industries, energy and the environment.[55] Professional, scientific and technical sectors account for 18% of the canton's employment, followed by healthcare and social work (14%). The canton is leveraging its high-tech industry and focusing on digitalisation as means to transform the economy.[56] Although this could have the potential to create new jobs, it could also risk excluding a share of the labour force. As some effects of climate breakdown are already visible, the local government is also focusing on adaptation: the Tsanfleuron glacier at Diablerets has been found to be melting at an increasing rate, for example, prompting the local government to adopt an emissions reduction target of 30% by 2050.[57]

In the canton of Vaud, 42,261 jobs are found to already contribute to the circular economy, equivalent to 9.14% of total employment in the canton. This is slightly above the national average.

Potential circular jobs across core, enabling and indirect sectors:

CORE JOBS

18% of total circular jobs in Vaud are **core circular jobs** (7,666), representing 1.6% of total employment. Again, repair and maintenance sectors contribute to the largest share of core jobs (90%), followed by jobs in waste management (9%) and regenerative energy production (1%). Recently, the canton has implemented several successful measures to limit municipal solid waste generation,[58] such as the waste bag tax. However, very few jobs are detected in sectors such as recovery of sorted materials (363) and wholesale of waste and scrap (158). This highlights the need to expand waste management measures to the many industries active in Vaud. The share of jobs in renewables is lower than national average, although increasing. The Bel Coster wind farm project on the Le Suchet mountain ridge will contribute towards ensuring the canton's local and sustainable energy supply, while making optimal use of its wind conditions, for example.[59]

ENABLING

7% of total circular jobs in the canton are **enabling circular jobs** (7,666), representing 0.6% of total employment. Most enabling jobs relate to the 'Design' (43%) and 'Digital' (27%) elements. Vaud is indeed a leading European hub in terms of technology and innovation, and its technology parks attract large numbers of international specialists.[60] The many multinationals in the canton have forged collaborations between industry and the academic sector: digital technologies are already enabling advancements in education[61] and the health sector.[62] Precision industries have emerged due to the canton's expertise in watch manufacturing, and are being applied in the fields of miniaturisation, micro and nanotechnologies for measurement instrumentation and robotics.[63] Nonetheless, these sectors only marginally interact with core sectors of the circular economy, not yet spurring the innovations needed to accelerate the transition. The Economic Development Canton of Vaud (DEV), a private non-profit association financed by the Canton, has been investing in innovation and technology for the development of new businesses over the last years, creating new jobs. This kind of financial support could be channelled towards increasing circular activities and strengthening these sectors' interaction with core jobs.

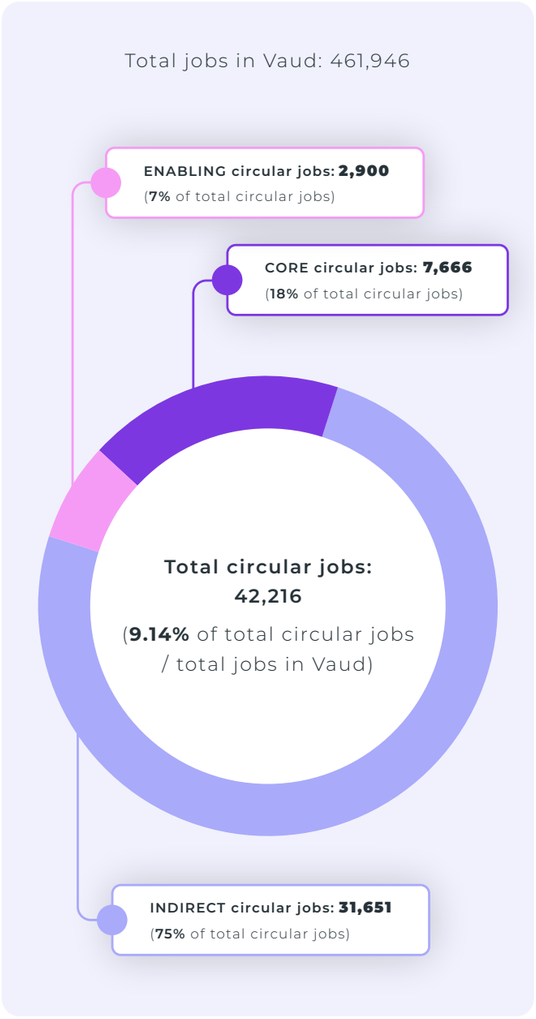
INDIRECT

75% of total circular jobs in Vaud are **indirect circular jobs** (31,651), representing 6.8% of total jobs. As Vaud is one of the country's top travel destinations, it is not surprising that the tourism and leisure sectors provide a large number of local jobs. While leisure and tourism provide many benefits for the economy, these resource-intensive activities can have significant negative impacts at the local and planetary scale. Shifting towards more sustainable tourism and leisure activities will help reduce environmental impacts from locals and visitors alike.

Case Studies

Cutting-edge digital and design innovations are already contributing to the circular economy of Vaud:

1. Business case: Ollas, an ancestral irrigation technique
2. Business case: Embiontech
3. Business case: Turning Waste in freight logistics into Intelligent Assets



5. THE WAY FORWARD

This first attempt to measure circularity via employment at the canton level is just the first step in Switzerland's circular journey, and will be followed by a Circularity Gap Report for the country, to be launched in 2023. This report will highlight next steps for Switzerland's national government and delineate its role on the global stage.

Switzerland boasts huge potential to scale its circular economy activities.

As one of the wealthiest countries in Europe (based on GDP per capita), rates of consumption and waste generation are too high, far surpassing the world average. However, this wealth also offers an opportunity to reshape resource use in a way that benefits people and the planet. The circular economy provides a means for local value creation and self-sufficiency, especially given the country's few natural resources, while also mitigating the impact of its high consumption rates on other parts of the world. To date, circular economy action has largely centred on waste management[64]—and while this is certainly a crucial part of the transition, there is far more to be done. By analysing employment activity in Switzerland, this report has uncovered that 9% of the country's workforce currently contributes to the circular economy—within the average range for Europe.[65] Most of these can be attributed to a strong repair and maintenance sector, which serves to keep materials in use as long as possible, and high levels of renewable energy generation—yet waste management lags behind due to high incarceration rates and the export of waste for recycling abroad. Zooming in, we've observed different levels of circular employment per canton, compared both to the national average and each other: Basel, for example, leads the way, surpassing other leading cities like Amsterdam in terms of circular jobs, while Zurich, Vaud and Bern rest below the national average. These differences stem from the cantons' differing specialisations, prevalence of urban areas and labour market composition.

Every job counts: big shifts will be needed in core, enabling and indirect sectors to scale circularity.

If managed well, the adoption of circular strategies can promote new employment opportunities while ensuring that workers are supporting sustainable industries. Switzerland's low unemployment rate indicates that the biggest opportunities will lie in changing the nature of existing jobs, rather than in job creation: roles that already exist in core, enabling and indirect sectors must all begin to support more circular practices and strengthen cross-sector collaborations. The country is well-poised to take on this challenge: it can leverage its international and highly-skilled workforce, redirecting workers' knowledge and skills to support circularity. For core sectors, this could mean scaling waste management, increasing local recycling and shifting away from incineration and export, while also bolstering activities that prevent waste to begin with. For enabling sectors, the focus will lie on increasing jobs in sectors that interact with core sectors: construction or manufacturing companies that prioritise secondary material use, or that practise deconstruction and disassembly, for example. Highly-skilled workers will be key in this regard, to spark innovation and shift away from the take-make-waste paradigm. The same applies for indirect sectors, which can aim to strengthen their relationship with and better support core sectors. The banking sector—which is a cornerstone of the Swiss economy—could use its substantial financial resources to support circular companies and initiatives, for example, while retailers that procure circular goods or adopt reverse logistics operations could boost customer satisfaction and improve their brand value.66 Changes in organisations and job profiles and skills will need to accompany this change.

Various stakeholders will all have a role to play in the circular transition.

Municipalities and catons, for example, can promote the circular economy and directly generate circular jobs by procuring locally-sourced circular jobs and services. They also have the mandate to shift waste management practices—focusing on local treatment and reprocessing—and set up waste prevention initiatives. These stakeholders can also facilitate circular job creation through knowledge-building and the provision of training and education curricula; and enable the transition by providing circular SMEs with financial backing to support innovation—as well as carrying out data collection to flesh out the landscape of viable circular products and business models. Municipal action can be supported by a range of policy instruments: the Basel-based Smart City Lab, for example, shows how better spatial planning can be leveraged, while Zurich's transport-based recycling system shows how cantons and cities can create infrastructure to support circularity. Other stakeholders, such as the business and financial sectors, will also have a crucial role to play in strengthening cross-sector collaborations and embracing circular innovation: SMEs offering circular goods and services will be the driving force behind this. One Zurich-based company, for example, is using solar energy to produce cement,[67] while another in Basel is making textiles out of organic waste.[68] Similarly, entrepreneurs can drive innovation by forming business associations to build economies of scale, and identifying and filling skills gaps. Finally, the government and financial sector will be crucial in creating an enabling environment for these companies to thrive, through loans and investments, for example.

Switzerland can leverage the circular jobs indicator as it embarks on its next steps.

The indicator uses employment data to provide a proxy for circular activity, illustrating the extent of progress in a given region. This tool will be invaluable to local and national policy makers, who can use it to make first steps in their city, canton, region or country: Amsterdam, for example, is using the indicator to measure progress towards a circular economy, and London has used it to examine the social implications of its actions in the transition, while Scotland is using it to raise awareness of what circularity looks like in practice.

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