

OFFICIAL SENSITIVE – Meeting with DM-P Aiwanger, 13/06/2022, Minister for Business, Trade, Tourism and Enterprise

MINISTERIAL ENGAGEMENT BRIEFING: IVAN McKEE

Engagement title	Meeting with Hubert Aiwanger, Bavarian Deputy Minister-President and Minister of Economic Affairs, Regional Development and Energy	
Engagement timings	13 June, 8:45 – 9:30	
Organisation	Bavarian State Government	
Venue and full address	Atlantic Quay, Room: Mackintosh	Postcode
Background/Purpose (including invitation history)	<p>To strengthen international relationships with Bavaria in relation to hydrogen.</p> <p>This meeting will be held prior to signing a Letter of Intent between the SG and Bavarian Economy Ministry on hydrogen technologies and a second Letter of Intent between the Scottish Hydrogen and Fuel Cell Association and the Bavarian Hydrogen cluster, H2 Bavaria between 10.00- 10.15</p>	
Meeting attendees/ Greeting party	<ul style="list-style-type: none"> • Hubert Aiwanger, Bavarian State Minister of Economic Affairs, Regional Development and Energy, Member of Parliament (MdL) • Alexander König, Member of Parliament (MdL, CSU) • Benjamin Adjei, Member of Parliament (MdL, BÜNDNIS 90/DIE GRÜNEN) • Dr. Sabine Jarothe (Bavarian Ministry of Economic Affairs, Regional Development and Energy, General Director) • Prof. Dr. Veronika Grimm, Centre Hydrogen Bavaria, Board of Directors • Andreas Zimmer, Consul General • [redacted], Interpreter • Prof. Dr. Ing. Messerer (Bavarian Ministry of Economic Affairs, Regional Development and Energy, , Head of Section Energy (Politics, Infrastructure and Research)) <p>[redacted] and [redacted] will provide official support.</p>	
Supplementary information/ Sensitivities	Please see Annex A and D for supplementary information and sensitivities	
Twitter handles of main representatives, organisations	@HubertAiwanger @H2B_bayern @InvestinBavaria	

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and suggested tweet cleared by comms		@GrimmVeronika
Official support and mobile number		[redacted] [redacted]
Ministerial car/ parking details		
Briefing contents Annex A – Opening remarks Annex B – Points to make during meeting with Herr Aiwanger Annex C – Biographies Annex D – Agenda including arrive, depart timings Annex E – Hydrogen top lines Annex F – Bavarian approach to hydrogen and Scotland Annex G – Bavaria background brief Annex H – Bavaria fact file <i>(Draft Lol with Bavaria attached separately)</i>		

OPENING REMARKS BEFORE SIGNING CEREMONY

Guten Tag Herr Aiwanger and the rest of the Bavarian delegation, and warmest welcome to Scotland.

We are here today to sign a letter of intent on hydrogen between Bavaria and Scotland that aims to intensify our cooperation in the field of green hydrogen and hydrogen technologies.

Hydrogen, as you all know, has rapidly emerged as a sustainable solution in decarbonising sectors such as industry and transport, and in the energy transition.

Last year, we launched our Hydrogen Action Plan which sets out what we need to achieve over the next 5 years.

Central to our Action Plan is our commitment to work collaboratively to share expertise, drive innovation and develop the sector more quickly at home and abroad.

Bavaria is a particularly obvious partner for Scotland.

We understand your long-standing emphasis on clean energy and your commitment to industrial decarbonisation, climate change action and economic growth.

Moreover, it is great that significant Bavarian companies, such as TÜV Süd (Toof Sood) are based in Scotland, and that Siemens Energy and BayWa.Re were successful in their bid into the ScotWind Leasing round.

And of course we are delighted that Fraunhofer's UK headquarters are in this very city, and we hope that we can extend our collaboration in the field of hydrogen with them as well.

I'm delighted therefore to be here for this important event today which marks the beginning of a hydrogen focussed partnership to strengthen cooperation between the nation of Scotland and the state of Bavaria.

I wish you a highly productive visit to Scotland and look forward to deepening our partnership between Scotland and Bavaria over the coming months and years.

SUGGESTED POINTS TO MAKE DURING MEETING WITH HERR AIWANGER

To note: this meeting will be conducted through an interpreter so please allow time between points for the interpreter to translate.

Welcome

- I'm very glad to welcome you to Scotland again and to build on the engagement that has been developing since Scotland and Bavaria signed our economic MOU in 2017.
- I was glad to hear that the Bavarian Landtag passed a resolution calling for closer cooperation with Scotland last summer, and welcome the opportunity to take that forward now through concrete engagement around hydrogen.
- The SG-funded Scotland-Germany Hydrogen Research Scheme is already sponsoring early-stage collaboration between the University of St Andrews and Munich Technical University (TUM) on new structures for the delivery of sustainable hydrogen.
- Welcome the opportunity today to sign a further Letter of Intent, which will sit below our 2017 agreement, in the area of hydrogen in particular.

Respective green hydrogen interests

- Scotland has the natural resources, skills and experience to be a major producer of green hydrogen for both domestic use and export.
- Significant progress has been made since your last visit to Scotland in 2019 where you met Ms Hyslop:
 - Since your last visit in March 2019 we published our Hydrogen Policy Statement which sets out policy positions supportive of hydrogen production and deployment and our commitment to making hydrogen a key element of Scotland's decarbonisation plans.
 - Additionally, last year we published a Hydrogen Action Plan which sets out the actions that we will take over the next five years to ensure Scotland is in the best possible position to achieve our ambition of 5GW of hydrogen production capacity by 2030 and 25GW by 2045.
 - We are already leading the way in supporting world-leading hydrogen demonstration projects, and have committed to invest £100 million in the hydrogen sector between 2021 and 2026.
- Highlight that Scotland has the potential to be a major producer of sustainable, secure and low-cost green hydrogen for both domestic use and for export, thanks to its geography and vast renewable resources.
- Our economic analysis concludes that Scotland has the potential to deliver up to 126TWh of green hydrogen per year by 2045, with up to 94TWh of hydrogen for export to Europe and the rest of the UK.
- Outline our future interests
 - Over the next few years, we are focused on taking action to secure the role of Scottish companies in the global hydrogen supply chain.
 - We want to work with our international partners to share expertise and develop the sector more quickly, and to ensure Scotland is prepared to play a key role in meeting the growing demand for hydrogen from import countries in Europe.

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- We believe we need to act quickly to put in place the necessary policy, regulatory and financial frameworks, and to develop robust supply global chains, upskill our people and lay the groundwork to unlock hydrogen investment and export opportunities.
- Invite Aiwanger to outline similar for Bavaria

How Bavaria and Scotland might work together

- Invite Aiwanger's and Professor Grimm's views on which areas may be suitable for industry and research collaboration.
- We look forward to Scottish industry and research being able to engage further – we also welcome the MOU to be signed today between SHFCA and H2 Bavaria, these cluster to cluster agreements represent an important ground-level component of our future co-operation.
- Global Scot David Scrimgeour has engaged with officials to highlight a number of potential areas for cooperation between Scotland and Bavaria and will be accompanying Minister Aiwanger during the visit.
- One opportunity for cooperation he has highlighted is between the Michelin Scotland Innovation Parc in Dundee and the Michelin "Clean Tech Park" currently being constructed on the site of a former tire factory near Bamberg in the north of Bavaria. The "Clean Tech Park", which enjoys support from Michelin, the Bavarian government and local government in Bamberg, will focus on new mobility concepts, drive systems and cutting-edge green technologies. There are opportunities for synergies and R&D cooperation with the Dundee site, which is a joint venture between Michelin, Dundee City Council and Scottish Enterprise, where work on fuel cells and hydrogen has been ongoing for a number of years.
- The delegation will also be visiting TÜV Süd's National Engineering Laboratory at the Scottish Enterprise Technology Park in East Kilbride. The Munich-based firm and Scottish Enterprise recently co-founded the construction of a new test flow laboratory as part of the Advanced Multiphase Facility for subsea engineering, which has the highest flow rate in the world for both gas and liquid within one facility and is expected to provide benefits to other sectors, including food and drink and aerospace.

To be aware:

1. [redacted] The Scottish Government is currently developing its £100m hydrogen investment package, with the first tranche of funding, designed to support innovation, due to launch shortly. While international partners are welcome to participate in projects applying to this fund, we don't currently plan to target this investment package at specific countries or regions.
2. [redacted]

Transport of hydrogen to Bavaria

- The technical, safety and infrastructure requirements to transport hydrogen produced in Scotland to Bavaria is a key consideration. We are engaging closely with international partners, and the UK Government on how Scotland might export hydrogen to Germany and in what form.

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- We are currently assessing the most cost-effective options for transportation and export of hydrogen from Scotland to Europe, and that it is likely that different options, such as gaseous hydrogen pipelines, and marine vessel transportation of liquid hydrogen, green ammonia and methanol, and Liquid Organic Hydrogen Carriers (LOHC), could all be used for export at different scales and depending on end-purposes and off-takers.
 - The Scot2Ger project, led by Scottish Power, KPMG and Wood and supported by Scottish Enterprise, is looking to export green hydrogen to Germany by ship by 2025 to serve a German transport market.
 - The Scottish Government are also funding the Net Zero Technology Centre to assess the potential to connect to a European Hydrogen Backbone by repurposing and optimising existing pipeline infrastructure or through the development of new infrastructure.
- With a nod to Professor Grimm, mention Scotland's increasing engagement at federal level and our interest, where it makes sense, in working with key states together to help share expertise and to transport the H₂ from where it is produced to where it is needed.

Asks:

1. Look forward to follow-up from Bavaria and to seeing the substance of the partnership emerging on both sides on the back of this agreement. [implicit ask]
2. What is Bavaria's view on how green hydrogen may be transported from the north German coast to the landlocked south, and in what form will off-takers wish to receive it in Bavaria?
3. To what extent is Bavaria in discussion with the federal government about the broader support and infrastructure required to transport hydrogen – in whatever form – across Germany? Within that context, what is Bavaria's willingness and scope to work also with northern coastal states such as Hamburg or Lower Saxony on import/export or with national infrastructure projects? [redacted]
4. Ask Prof Grimm for her views on how Scotland might best be able to contribute to Germany's green energy security, from her perspective as an expert adviser and her role on the National Hydrogen Council. What would her wish be for the focus of our engagement across Germany as a whole and with Bavaria in particular?
5. Ask to what extent Bavaria engages with other states and the mechanisms for engagement with the Federal government on hydrogen.

ANNEX C
BIOGRAPHIES



Hubert Aiwanger, Bavarian Deputy-Minister President, Minister of Economic Affairs, Regional Development and Energy

(Pronounced Eye-Vanger with a hard “g”)

Hubert Aiwanger has been Deputy Minister-President and Minister of Economic Affairs, Regional Development and Energy for the German state of Bavaria since November 2018.

Aiwanger grew up in the village of Inkofen and has lived there throughout his life, now with his partner (also a member of the Bavarian state parliament). Aiwanger studied agriculture engineering at the Weihenstephan College and initially helped run his parents’ farm.

Aiwanger joined the Free Voters of Bavaria in 2002. The Free Voters (FV) is a loose association, usually of electoral candidates who are not registered to any political party, that generally favours devolution of decision-making to local bodies while broadly adopting a centre-right ideology.

Aiwanger rose rapidly through the party organisation, becoming state chairman of the Bavarian FV (a more organised entity in comparison to other state FV groupings) in 2006 and federal chairman of the FV in 2010. He led the FV to record state election results in Bavaria, achieving 10.2% in 2008, 9% in 2013, and a record 11.6% in 2018, a total which saw them become the junior partner in a CSU-led coalition government. As the FV’s lead candidate, Aiwanger became Deputy Minister-President beneath the CSU’s Minister-President Markus Söder. He also became Minister for Economic Affairs, Regional Development and Energy. His predecessor in this role, Ilse Aigner, signed the MOU with Scotland in 2017.

Aiwanger previously visited Scotland in March 2019, when he met CabSec External Affairs, Ms Hyslop, and visited the Levenmouth hydrogen facility.

Further members of delegation attending meeting



Prof. Dr. Veronika Grimm is important for our Scottish interests due to her role as Co-Chair of the Bavarian hydrogen cluster, H2 Bayern, and her membership of Germany’s National Hydrogen Council. A lifelong academic, she has been Chair of Economic Theory at Friedrich-Alexander University Erlangen-Nuremberg since 2008. She joined the board of H2 Bayern in 2019.

Professor Grimm is a member of various advisory bodies at federal and EU level, most significantly the National Hydrogen Council, which advises the German federal government on hydrogen. She therefore represents a particularly influential person for Scotland as we increase our engagement with the federal government, following on from Mr Matheson’s meeting with the federal government’s hydrogen commissioner Dr

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Stefan Kaufmann a few weeks ago. She has recently returned from a hydrogen mission to Australia, alongside Dr Kaufmann, which resulted in a clear commitment by Australia to export green hydrogen to Germany, beginning in 2025. Professor Grimm also met with Mr Robertson during his recent attendance at the Ludwig Erhard Summit in Bavaria in April.

In addition to her position at H2 Bayern, Prof Grimm is a member of the newly expanded Federal Ministry for Economic Affairs and Climate Action's (BMWK) Scientific Advisory Board, as well as the BMWK's Expert Commission on the "Energy of the Future" monitoring process. She is one of three council members of Germany's Council of Economic Experts.

The Bavarian state founded the H2 Bayern to strengthen Bavarian industry's technological leadership across the hydrogen economy by bringing together players in industry, science and politics. H2 Bayern has recently developed the Hydrogen Roadmap for Bavaria, together with partners in the Bavarian Hydrogen Alliance.

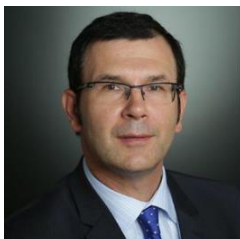
Alexander König, Member of the Bavarian Parliament (CSU)

Benjamin Adjei, Member of the Bavarian Parliament (Green)

Dr. Sabine Jarothe (General Director, Regional Development and Energy, Bavarian Ministry of Economic Affairs)

Prof. Dr. Ing. Messerer (Bavarian Ministry of Economic Affairs, Regional Development and Energy, Head of Section Energy (Politics, Infrastructure and Research))

David Scrimgeour, a GlobalScot who has run his own consultancy in Munich for many years, recently focussing on hydrogen. David ran the Germany *Locate in Scotland* office from Munich until it was merged with Scottish Trade International to create SDI in 2002. He is a close contact of the Germany Hub and currently focussing attention on encouraging Bavaria engagement with Scotland.



Dr Andreas Zimmer has been Consul General for the federal Republic of Germany since April 2021. The Consulate General has maintained the close relations between Germany and Scotland for more than 60 years. It is also the point of contact for all German nationals in Scotland.

[redacted], Interpreter

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ANNEX D

AGENDA AND LOGISTICS

Time	Location	Activity
0845 – 0930	MacIntosh Room, AQ5 *refreshments will be provided next door in the James Watt Room*	Ministerial meeting
0930 – 1000	James Watt Room, AQ5	Join the presentation on Hydrogen
1000 - 1015	James Watt Room, AQ5	Signing of Letter of Intent on hydrogen between Scotland and Bavaria Signing of SHFCA-H2 Bayern Letter of Intent. Minister McKee to say a few words

HYDROGEN TOP LINES

Key messages

- **Scotland is prepared to play a key role in meeting the growing demand for hydrogen** and is focused on securing the role of Scottish companies in the global hydrogen supply chain and working with our international partners to share expertise and develop the sector more quickly.
- Scotland's extensive renewable resources means we are well-placed to ensure long-term **security of supply of green hydrogen in Europe**. Scotland is just 750km from the North German coast.
- Scotland's huge potential for renewable energy generation, with a pipeline of 40GW renewable energy projects, perfectly complements our ambitions to produce industrial-scale quantities of renewable hydrogen for domestic use and export.
- Scotland's legacy oil and gas infrastructure, combined with an experienced energy and oil and gas workforce and a supply chain focused on energy transition are critical to establishing a prominent role for Scotland in the emerging global hydrogen market.
- Scotland's draft Hydrogen Action Plan, published in November 2021, outlines how we will focus on taking action to secure the role of Scottish companies in the global hydrogen supply chain, to work with our international partners to share expertise and develop the sector more quickly, and to ensure Scotland is prepared to play a key role in meeting the growing demand for hydrogen.

Scotland's hydrogen engagement in Bavaria

- Engagement with **Bavaria** is being developed within the scope of the 2017 Joint Declaration of Intent between Scotland and Bavaria, with its focus on economic cooperation. Bavaria's Hydrogen Strategy, published in August 2020, and its Hydrogen Roadmap published in April 2022, explicitly name Scotland as a potential import country.
- The Germany Hub engages regularly with H2 Bavaria, which is headquartered in Nuremberg, and has provided speakers for its Nuremberg Hydrogen Dialogue. Ongoing plans include a visit by H2 Bavaria as part of the 2022 Nuremberg visit to Glasgow in May 2022, followed by a visit by Bavaria's Economy Minister Hubert Aiwanger in June
- The **Scot2Ger** project, announced at COP26, aims to evaluate the opportunity for Scotland to export green hydrogen at scale from Scotland to Germany and to demonstrate the delivery of green hydrogen produced in Scotland to offtakers in Germany by the mid-2020s. Lower Saxony is an important partner for this project as Wilhelmshaven is the project's German port of choice. The key offtakers will be in NRW. The project is supported by Scottish Enterprise and led by Scottish Power, Wood, DS Consulting and KPMG Germany.

Development of a Hydrogen Economy in Scotland

- The Scottish Government has led the way in supporting world-leading hydrogen demonstration projects and is now committing to invest £100 million in the hydrogen sector in Scotland over the next five years.

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- The Scottish Government has a historic strong track record of supporting world-leading hydrogen demonstration projects in Scotland, including
 - the H100 Project in Fife which will deliver the first domestic hydrogen heat network in the world. This will afford 300 local households the opportunity to switch from natural gas to 100% green hydrogen for heating their homes;
 - A fleet of 65 hydrogen vehicles in Aberdeen, including twenty five double decker hydrogen buses delivered through a flagship EU funded project; and
 - In Orkney, we have the world's first hydrogen production from tidal energy; as well as the BIG HIT project, which has been leading the way with the development of green hydrogen territories and sharing lessons learned to help other EU supported projects.
- We are now working in partnership with industry to scale up hydrogen production in Scotland to serve both a domestic and an export market.
- We expect renewable hydrogen production in Scotland to increase at pace throughout the 2020s supported by onshore wind.
- Onshore wind is a cheap and reliable source of electricity generation, with Scotland's resource and commitment seeing us lead the way in onshore wind deployment and support across the UK.
- This early hydrogen production will support the growth of a domestic market and the development of the distribution, storage and port infrastructure required to serve a future export market.
- Through the late 2020s and 2030s Scotland's vast offshore wind resources will bring forward large-scale renewable hydrogen production and will allow Scotland to become a major producer and exporter of renewable hydrogen.

Sensitive issues:

If prompted on the **issue of low carbon hydrogen** –

- We consider that low carbon hydrogen will play a significant role in establishing a hydrogen economy in Scotland. Low carbon hydrogen can be utilised to provide substantial volumes to help achieve our 2030 5GW ambition, and provides a clear route for our existing industry to deliver a just transition, utilising the skills and expertise already in Scotland.
- CCUS unlocks the production of low carbon hydrogen at scale, providing a domestic source of energy production that has the potential to increase energy security whilst facilitating demand for fuel switching and, therefore, hydrogen produced from renewable sources in the long-term.

If prompted on **SG alignment with UKGov for the development of the sector:**

- **Many of the levers** required to support the emergence of a flourishing hydrogen economy in the devolved nations **are reserved to the UK Government**, and so we will continue to work closely with the UKG to ensure that our collective vision for the development of the hydrogen economy is aligned and the benefits are realised across all nations of the UK.
- We are committed to engage with the UK Government on the development of a UK policy and regulatory framework for hydrogen, business models, market mechanisms and fuel standards while ensuring that these align with the EU

BAVARIAN STRATEGIC APPROACH TO HYDROGEN AND SCOTLAND

Bavaria introduced its hydrogen strategy in May 2020, which specifically cited Scotland as a possible import country for green hydrogen, alongside Norway. In May this year it published its Hydrogen Roadmap, prepared by H2 Bavaria, an excerpt of which is below.

It is worth noting that the Germany hub has developed a close relationship with the Bavarian hydrogen cluster, H2 Bavaria, which is based in Nuremberg. Both the Head of Hub and CEO of SHFCA, Nigel Holmes, have spoken at its annual Hydrogen Dialogue.

Bavarian Hydrogen Roadmap - Executive Summary

Bavaria is aiming for the ambitious goal of being climate neutral by 2040. This means that the Free State of Bavaria is pursuing a more ambitious path than the Federal Government or the EU. It is certain that this goal cannot be achieved without the use of hydrogen across all sectors. The implementation of a hydrogen economy is associated with considerable efforts and has to be started immediately due to partly very long planning and investment cycles. This means: the right Bavarian course must be set promptly, on the one hand to achieve the climate targets that the Bavarian State has set itself, and on the other hand, to take advantage of the economic opportunities arising from the upcoming transformation. The Bavarian Hydrogen Roadmap is intended to identify perspectives and concrete needs for action as well as to contribute to accelerating the ramp-up of the Bavarian hydrogen economy.

Hydrogen consumption

It is expected that the demand for hydrogen will increase faster in Bavaria than in other federal states due to the State's more ambitious climate targets. The sectors with the greatest demand will be both the mobility and the conversion sector, the latter comprises the petrochemical industry (refineries) on the one hand and (central) electricity and heat generation on the other. However, a significant increase in hydrogen demand is also expected in the industrial and in the heat sector. In the industrial sector, hydrogen and its derivatives, such as methane, are mainly used to provide access heat. The use of hydrogen as a raw material, for example in the production of green steel or green basic chemicals such as methanol or ammonia, currently plays a rather small role in Bavaria. Overall, the demand for hydrogen and synthetic energy sources will increase to 33-75 TWh by 2040. By 2030, consumption will double from about 5 TWh today to about 10 TWh.

Hydrogen supply

The capacities for producing green hydrogen via electrolysis are rather low due to the low potential of renewable energy in Bavaria. In order to be able to meet the rapidly growing demand for hydrogen, Bavaria will have to rely on imports of hydrogen and hydrogen derivatives in the long term. The significantly more ambitious expansion targets for renewable energies formulated by the new Federal Government in the coalition agreement will also create new opportunities for the production of green hydrogen in Bavaria. By 2030, at least 1 GW of electrolysis capacity must be installed in Bavaria (2025: 300 MW) to meet the assumed additional demand for hydrogen. Especially regarding a decentralised hydrogen supply, the use of hydrogen from biomass can also make a decisive contribution. At the same time, it should be

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assessed to what extent blue or turquoise hydrogen can play a role during a transition phase in the ramp-up of the hydrogen economy. In addition to hydrogen production in the Free State itself, Bavaria's connection to the European Hydrogen Backbone must be accelerated in order to ensure a baseload supply for the most important consumers from 2030 onwards.

Business location

The transformation of global economies towards climate neutrality is associated with great opportunities for the export-oriented Bavarian economy. There are already numerous companies in Bavaria that are active in the broad field of hydrogen. Other companies have recognised the incipient transformation of the economy and are looking for ways to contribute their existing know-how to sustainable markets that are fit for the future. The hydrogen economy offers excellent starting points, e.g. for Bavaria's very important industrial sectors of (specialist) mechanical engineering, energy, process and electrical engineering as well as mobility applications. In total, well over 40% of Bavarian employees in the manufacturing sector work in industries that are potentially relevant for hydrogen technologies – this corresponds to about 9% of the total number of employees in Bavaria.

Science location

Bavaria's universities and higher education institutes are among the most innovative ones in Europe, and in many disciplines they are also among the global leaders in research. This outstanding expertise also extends to the very broad field of hydrogen research. Bavaria is particularly well positioned in the field of electrolysis technology and (chemical) hydrogen storage and conversion. This good position is to be further strengthened and expanded.

Regulatory framework

Many hydrogen technologies fail to enter the market not because of a lack of technological maturity, but because of the unfavourable regulatory framework. In order for climate-friendly hydrogen to become competitive in the near future, the regulatory framework must be adjusted. This includes, for example, making the production of climate-friendly hydrogen cheaper (e.g. by reducing state-induced components of the electricity price), making climate-damaging behaviour more expensive (e.g. through appropriate carbon pricing) and partially offsetting the initially expected differential costs between climate-friendly and climate-damaging technology (e.g. Carbon Contracts for Difference). In this regard, Bavaria has very little scope for action. Nevertheless, the Free State can and will contribute in a constructive way to political decision-making processes at federal and EU level.

Demonstration projects

Demonstration projects are excellent instruments for bringing hydrogen technologies, which are not economically viable under the current regulatory framework, into the field while at the same time developing them further. Bavaria should continue investing in research and development of hydrogen technologies, and furthermore, place and accompany Bavarian players in the best possible way in the competition for national and European funding. The targeted support of individual demonstration projects enables regional spill over effects and can help to further establish hydrogen technologies in Bavaria.

Recent Bavarian action on hydrogen

In May Bavaria's Council of Ministers approved the purchase of a plot of land for a hydrogen technology application centre (WTAZ) in the town of Pfeffenhausen. The centre, including a 5-MW electrolyser, will enable companies to develop, test and certify hydrogen technology products for mobility applications.

The WTAZ plans to focus on the value chain for hydrogen and fuel cell technology for mobility applications from 2024 on. A 5-MW electrolyser is to start producing green hydrogen at the site in 2023.

Commercial vehicle manufacturer Daimler Truck AG is already planning to use the centre to test the hydrogen-powered trucks with a range of around 1,000km (621.4mi) that it is currently developing, a plan praised by Minister Aiwanger.

The project was supposed to receive €100 million in funding from the federal government but the amount was cut to €72.5 million last week. Bavaria will support the project with €30 million. The funds from the federal government will be used for the construction of the building and infrastructure as well as for the equipment and the initial financing of the operating costs.

The hydrogen centre in Bavaria is one of four national hydrogen centres planned across Germany. The other three centres will be built in Chemnitz, Duisburg and in the north of the country.

This action should be read in the context of Bavaria being particularly vulnerable within Germany to a potential suspension of Russian gas supplies – the west of Germany generally relies on gas from the Netherlands while the north receives Norwegian gas, while Bavaria is heavily reliant on gas via the Nordstream 1 pipeline, as well as via Ukraine. If an emergency were declared gas supplies would theoretically be redistributed across the country but there is no precedent for this.

Aiwanger: Hydrogen from Scotland and Norway

Bavarian Economy Minister Hubert Aiwanger is counting on additional energy supplies from Scotland and Norway for the future to secure Bavaria's energy supply. In mid-June, the Free Voters leader plans to travel to both countries to agree on corresponding partnerships for the production and supply of green hydrogen.

"I am sure that this will be a very good fit," Aiwanger told Deutsche Presse-Agentur in Munich. He cited cultural and geographic proximity - especially to Scotland - as advantages. In addition, he said, both countries also fit well with Bavaria politically and there is already a close exchange and familiarity through town twinning for example.

"Scotland and Norway are important European producers of renewable energies. We want to use this for the energy transition in Bavaria," Aiwanger emphasized. "It is important that Bavaria is quickly connected to the European network of hydrogen pipelines. Then we can produce green hydrogen - ideally with Bavarian technology - in Norway and Scotland and transport it to Bavaria."

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Last week, Aiwanger met Scotland's Minister for Foreign Affairs, Angus Robertson, on the sidelines of the Ludwig Erhard Summit in Tegernsee.

Robertson then invited Aiwanger to visit Scotland, with the visit set to take in Aberdeen and Edinburgh. According to Robertson, Scotland is planning to invest massively in offshore wind power plants. The country has a wind power potential of about 25% of the total EU potential.

Aiwanger will be accompanied on the trip by energy experts and representatives of the business community. The aim is to sign a declaration of intent for cooperation between Scotland and Bavaria in the field of hydrogen. However, the transport to Bavaria would also have to be clarified. From Aiwanger's point of view it would also be desirable to include Scottish companies in the Hydrogen Alliance of Bavaria and to station a Bavarian contact person for hydrogen in Scotland.

Since the outbreak of the war in Ukraine, the state government has been very keen to break away from its previous dependence on Russian energy supplies. Minister President Markus Söder (CSU) therefore actually intended to travel to Saudi Arabia before Easter to facilitate new partnerships. However, the trip had to be postponed at short notice due to Söder's Corona infection. A follow-up date has not yet been set.

Die Zeit (26 April 2022)

SCOTLAND'S ENGAGEMENT WITH BAVARIA

Scotland has a strong relationship with Bavaria and is committed to further enhancing its cultural, economic and political links. These leverage the mutual goodwill between Scotland and Bavaria that stems from longstanding historical and cultural connections, including numerous twinning arrangements.

In 2017, the Scottish Government and Bavarian Ministry of Economic Affairs and Media, Energy and Technology signed a Joint Declaration of Intent, updating an earlier agreement from 2003. This was signed by First Minister Nicola Sturgeon and then Bavarian Deputy Minister President and Minister of Economic Affairs, Ilse Aigner – now President of the Bavarian Parliament. It seeks to enhance economic co-operation, and has been followed by numerous SDI and Chambers-led trade missions in both directions. Ilse Aigner's successor as Economy Minister, Free Voter Hubert Aiwanger, visited Scotland in early 2019.

There are strong mutual interests between Scotland and Bavaria in the fields of renewable energy, climate protection and adaptation, and research and higher education. In 2020, Scotland took over the European co-chairmanship of the Under2 Coalition, of which Bavaria is a member. Over the past year we have extended our interests from economic development to include hydrogen and environmental protections (peat restoration).

Political and civic links

- Scotland has many civic ties with Bavaria; over 80% of its twinning partnerships are with Bavaria. These important relationships were initiated after World War II, when the Edinburgh Corporation invited a group of young people from Munich to visit Scotland. Munich became Edinburgh's first twin city in 1954, followed by twinings between Glasgow with Nuremburg, Inverness and Augsburg, Aberdeen and Regensburg. Nuremberg representatives visited Glasgow in May 2022.
- In 2003, a co-operation agreement was signed by former First Minister Jack McConnell and then-Minister for Federal and European Affairs, Reinhold Bocklet.
- In March 2017, the First Minister and then-Deputy Minister-President (now President of the Bavarian Landtag) Ilse Aigner signed a Joint Declaration. This seeks specifically to enhance economic co-operation through stronger business links, collaboration across research and innovation and greater investment.
- The Scottish Government Germany Hub subsequently commissioned a report into Scotland's relations with Germany, which considered areas of collaboration, including energy and climate change; space; technology and manufacturing, life sciences and higher education. This was carried out by David Scrimgeour, DS Consultants, who will be attending your meeting on 13 June.
- More recently, in June 2021, the Bavarian Parliament passed a resolution, initiated by the Committee for European Affairs, that the friendship and cooperation between the Scottish and Bavarian parliaments should be further strengthened and enriched.
- Over the past year we have extended our interests from economic development to include hydrogen and environmental protections (peat restoration). A potential cooperation on peat restoration with Scotland has been included by the Bavarian Environment ministry in the UK-Bavaria partnership programme.

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- Fraunhofer UK and the Fraunhofer Centre for Applied Photonics are located at Strathclyde University. The Max Planck Partnership in gravitational waves is located at Glasgow University and four other Scottish higher education institutes. We are looking to build on these as part of our collaboration.

Economic and environmental links

Bavaria is an important economic partner for Scotland, most notably across the areas of hydrogen, space, AI, the creative industries and entrepreneurship. See below for trade mission engagement.

In particular, we have developed a close relationship with the Bavarian hydrogen cluster, H2 Bavaria, which is based in Nuremberg. In its hydrogen strategy of May 2020, Bavaria cited Scotland as one of its possible import regions for green hydrogen. Scottish government representatives have spoken at the first two Bavarian Hydrogen Dialogues, and H2 Bavaria will be visiting Scotland in May 2022.

Research collaboration and Higher Education Partnerships

The 2017 Joint Declaration includes a commitment to support collaboration between Scottish and Bavarian research institutions. The Fraunhofer Institute, headquartered in Munich, is proud of its partnership with the University of Strathclyde: the Fraunhofer Centre for Applied Photonics is the first UK Fraunhofer research centre, and Fraunhofer UK is headquartered at Strathclyde. These were established with collaboration and financial support from the Fraunhofer-Gesellschaft; Scottish Government; Scottish Funding Council; Scottish Enterprise; and the University of Strathclyde.

As UK universities seek to strengthen their partnerships with German universities under the Turing scheme, the Bavarian parliamentary committee for Federal and European Affairs has voiced its support for closer co-operation between Bavarian and Scottish universities. Existing partnerships exist between the Universities of Edinburgh and Munich, and between the North Bavarian University and the University of the West of Scotland.

On 8 April 2022, the Scottish Government announced funding for a joint project between the University of St Andrews and the TUM Munich Technical University to investigate new structures for the delivery of sustainable hydrogen as part of the Scottish-German Hydrogen Research scheme.

Recent engagement

- 21-22 April 2022 - Cabinet Secretary for Constitution, External Affairs and Culture attends Ludwig Ehrhard Gipfel, Tegernsee
- February 2022 – webinar with Bavarian Chamber of Commerce, SDI and BCCG Scotland – on themes of post-Brexit economic engagement hydrogen and AI
- February 2022 –trade and investment call between FM and Roland Busch, CEO of Siemens AG
- September 2021 – Meeting between President of Bavarian Parliament, Ilse Aigner, and Presiding Speaker of Scottish Parliament, Alison Johnstone (online due to Covid restrictions)

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- June 2020 – Discussion between Deputy Presiding Officer of Scottish Parliament, Linda Fabiani, and president of Bavarian Parliament, Ilse Aigner on Young Women Lead leadership programme (online due to Covid restrictions)
- Feb 2020 – Inverness Chamber trade mission to Augsburg & Landshut
- Jan 2020, Scottish Government's Germany hub co-hosted first Munich Burns Supper with the Consul General in the Munich Residence
- Nov 2019 – Glasgow Chamber trade mission to Bavaria
- April 2019 – Economy Minister Aiwanger visited Scotland, meeting CabSec Ms Hyslop
- Sept 2018 – Bavarian textiles and creative industries mission to Scotland
- June 2018 – SDI-led cross-sector mission with Glasgow and Edinburgh Chambers to Berlin, Nuremberg and Munich
- March 2018 – SDI-led technology and smart cities trade mission to Munich
- Feb 2018 – SG announces £5m continued funding for Fraunhofer Centre for Applied Photonics at Strathclyde University
- Sept 2017 – Bavarian chancellery/universities visit to Edinburgh and Glasgow
- Oct 2017 – Glasgow Chambers Mission to Nuremberg
- May 2017 – Trade visit by Inverness Chambers to Augsburg
- April 2017 – MoU signed between University of the Highlands and Islands and Augsburg Clinic
- March 2017 – Bavarian Energy Mission to Scotland, including Edinburgh Castle reception hosted by Minister Wheelhouse and signing of Joint Declaration

Forthcoming engagement

- 14th June 2022 - Scotland House London to attend 10th Anniversary of Fraunhofer UK and Fraunhofer Centre for Applied Photonics

Examples of Bavarian Investors in Scotland

- Alois Müller GmbH & Co. KG
- BayWa AG
- Bosch Rexroth
- Fraunhofer
- Siemens Technology Accelerator GmbH
- TÜV SÜD (Oct 2019: official opening of their new Advanced Multiphase Facility in East Kilbride, supported by Scottish Enterprise R&D grant and positioning Scotland as a world leader in multiphase flow measurement)
- Sky Germany GmbH

Examples of Scottish Investors in Bavaria

- Aggreko PLC
- Ayrshire Metal Products Public Limited Company
- Murgitroyd & Company
- Optical Express
- TVSquared

BAVARIA – KEY DATA

Population: 13.1 million

Area: 70,552 km² (largest)

Capital: Munich (population 1.57m)

GDP (2021): €661.5bn (ranked 2nd out of 16)

GDP per capita (2020): €50,289 (ranked 3rd out of 16)

Unemployment (2022): 3.0% (lowest)

Public debt (2021): €2810 per capita (lowest)

Minister President: Markus Söder (CSU, since March 2018)

Government: CSU-led coalition with the Free Voters

Last election: 14 October 2018:

<u>Party</u>	<u>Votes</u>	<u>Seats</u>
CSU	37.2%	85
Greens	17.6%	38
Free Voters	11.2%	27
AfD	10.2%	22
SPD	9.7%	22
FDP	5.1%	11

Next election: 2023

Votes in the Bundesrat: 6

Number of Bundestag members: 117 (46 constituencies, 71 list members)



BAVARIA'S PROFILE

The Free State of Bavaria is the largest of Germany's 16 federal states, both in area and population, comprising around a fifth of the total land area and just under a sixth of the population. It is divided into seven *Regierungsbezirke* (administrative divisions), which are in turn divided into 71 *Landkreise* (rural districts) and 25 *Kreisfreie Städte* (district-free cities).

Lying in the south of Germany, Bavaria has a distinct history and tradition within Germany, as a Roman Catholic stronghold (particularly in the south of the state) which was a fully sovereign state until the 1871 Unification of Germany, when its policy of playing off its Prussian and Austrian neighbours against one another became untenable. Bavaria continued to have its own monarch until 1918. Bavarians still maintain a spirit of loyalty to the Free State of Bavaria. The Bavarian Government, while supporting the European Union, is a strong advocate of regionalism and of a clear definition of the competences of the EU. It is wary of any EU encroachment on the rights of the Länder.

Its capital Munich suffered heavy damage during the Second World War but has rebounded to become an economic and cultural centre of Germany, retaining much of its traditional architecture and customs which continue to prove attractive to tourists. Its population now amounts to around 1.5 million inhabitants. The city of Nuremberg is another example of successful reconstruction after heavy wartime damage, while huge

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numbers of visitors flock each year to Regensburg, Bayreuth and the string of towns at the foot of the Alps at the southern end of the state bordering Austria. Bavaria has gone from being an agricultural state whose economic stature was significantly lower than that of its northern neighbours to an economic powerhouse, now enjoying the lowest unemployment rate of any state while being home to some of Germany's most significant companies, including BMW, Audi, Allianz and Siemens.

POLITICS

Bavaria's governments have been led by the CSU for all but three years throughout the post-war period, with the occasional coalition partner required to achieve a majority in the Landtag. The CSU are a sister party of the CDU and as such the two do not compete against each other, although the CSU are widely seen as slightly more conservative than their CDU partner. Munich, by contrast, is an SPD stronghold whose government has been led by the SPD for all but six years since 1948.

CSU figures have often played a leading role in federal governments, with Söder's predecessor as Minister-President Horst Seehofer serving in Berlin as interior minister between 2018 and 2021. However, Ludwig Erhard's spell as Chancellor between 1963 and 1966 marks the only time since the Second World War that a Bavarian has served as Federal Chancellor. Two CSU candidates, the Bavarian political titan Franz-Josef Strauss and later Edmund Stoiber, have been put forward as candidates for chancellor by the CDU/CSU Union in 1980 and 2002 respectively, but both were unsuccessful.

In the latest Bavarian elections on 14 October 2018, the CSU suffered heavy losses, attributed by many commentators to disputes over refugee and immigration policy between the Bavarian and federal governments. The biggest beneficiaries of this were the Greens, who overtook the SPD as the largest opposition party, and the AfD. However, the CSU were still by far the biggest party and secured a coalition with the loosely organised *Freie Wähler* (Free Voters) Party, whose leader Hubert Aiwanger became Finance Minister and Deputy Minister-President. Söder has since enjoyed a resurgence in popularity, partially due to his deft handling of the Coronavirus pandemic, leading to feverish speculation as to whether Söder would attempt to become Chancellor in the 2021 elections. Söder belatedly declared his candidacy in April 2021 but withdrew it just days later after the CDU's national board declared its support for Armin Laschet of North-Rhine Westphalia.

ECONOMY

Bavaria is regarded as one of the most attractive economic regions in Europe, but high wage and living costs are an increasing challenge. No German State has undergone so radical a transformation of its economic structure since the War as Bavaria.

Predominantly agricultural until the 1950s, Bavaria has evolved over the past few decades into an economy that is now based on high-tech and service industries including electronics and media/telecommunications. Apart from being the centre for the electronics and aerospace industries it has emerged as one of the leaders in the automotive, insurance, publishing and biotechnology sectors. The growth of the electronics industry started with the relocation of Siemens from Berlin after the war. The rebuilding of BMW and the expansion of MAN and Audi helped strengthen Bavaria as a

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manufacturing base. The aerospace companies that eventually became part of Daimler Chrysler Aerospace - now EADS - underlined the region's status as a high-tech centre.

Allianz, the second largest general insurance company in Europe, and Munich Re, the largest re-insurance company in the world, are based in Munich. Sixt is now the largest vehicle hire company in Germany (with over 500 locations) and has ambitions to become the largest in Europe. Sports goods manufacturers Adidas and Puma are all located near Nuremberg. BMW and MAN Commercial Vehicles both have their head offices in Munich. Audi is based in Ingolstadt.

Other important sectors are filmmaking, multimedia and publishing, toy making (Nuremberg houses the world's leading toy fair); ceramics and glass; and, of course, brewing. Bavaria produces around a quarter of Germany's crops and a third of its timber. Family farms predominate.

Since 1994, as part of a concerted drive to support high tech industries, the Bavarian government has invested more than € 4.3bn of privatisation revenues in research and technology initiatives, especially in the life sciences, ICT and new materials sectors. The Max Planck and Fraunhofer Research Societies, and the German and European Patent Offices are all based in Munich.

Munich as an international trade fair centre attracts 6.3m foreign visitors annually (second only to Frankfurt). It is especially strong in construction, electronics, waste disposal, sports goods and the drink industry. Munich's international airport is the second largest in Germany. Munich annually hosts "Oktoberfest" attracting visitors from all over the world. Bayreuth is home to the annual Wagner opera festival.

German international companies based in Bavaria include BMW, truck manufacturers MAN and brake manufacturers Knorr Bremse, a strong defence industry presence with EADS and Krauss-Maffei, global engineering giant Siemens and the German branches of Sky and Vodafone.

UK firms with a significant presence in Bavaria include Glaxo SmithKline, Smiths Industries, Cable & Wireless and COLT. British Aerospace is part of the Tornado and Eurofighter projects based outside Munich.