



Building for the future: Spain and Victoria, Australia

**Skills, innovation and digitalisation
needs for a low carbon future**



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Building for the future: Skills, innovation and digitalisation needs for a low carbon future

The Future Europe Series is an initiative of RMIT Europe and the State of Victoria's European Trade and Investment office. It aims to inspire collaboration, spark new ideas and create tangible outcomes that will drive positive change to achieve the low-carbon transition we need.

The series brings together the insights from industry, government and academic leaders in Spain and Victoria on the challenges and opportunities of the transition to a decarbonised economy in an increasingly digital world. As we plan and build for a low-carbon future on a global scale, it is incumbent on both the private and public sectors to collaborate, exchange knowledge, and share the responsibility of making necessary change happen.

Both Spain and Victoria are addressing the challenges of making the low-carbon transition a reality. This series convenes the critical themes that will require bilateral cooperation and the strengthening of partnerships to achieve accelerated progress at scale in the areas of skills, innovation and digitalisation.



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The State of Victoria in Australia is known for its diverse economy, cutting-edge research and innovation and its commitment to sustainable development.

The State of Victoria recognises the utmost importance of fostering strong relationships with international partners and places a high priority on its international footprint and connections.

The State boasts the most extensive global network among Australian states and Territories with 23 international offices.

In 2023 it opened its latest office in Paris to strengthen its relations with European states and grow its reach and impact.

Trade and investment links between Victoria and Spain are strong and growing, with Spanish companies bringing significant expertise in the transport, infrastructure and renewable energy sectors, supporting the Victorian Government's commitment to achieve its net-zero emissions target by 2045.

Prominent Spanish companies with operations and presence in Victoria include ACCIONA, Iberdrola, Blue Float, Wallbox and Sener, among others.

Together with the insights of experts from industry, government and academia and in the context of Spain and Victoria bilateral relations, the Future Europe Series aims to shed light on the skills, innovation and digitalisation needs as we transition our businesses and our society towards a sustainable future / decarbonised economy.

We see this series serving as a comprehensive resource for Spanish companies interested in investing in Victoria's dynamic economy and contributing to building its future.

Gönül Serbest

Commissioner for Victoria to Europe, Middle East, Türkiye and Africa

What skills will graduates need to be prepared for the future of work and to meet the demands of industry? What is needed for the current workforce to upskill and reskill for the green economy?

Sustainability and digital skills are critical

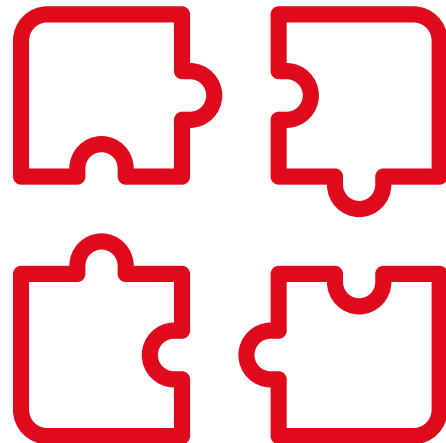
Engineers are now immersed in a new transformation with sustainability and digitalisation at its centre. Engineers will not only need to be proficient with software but also be able to verify and manage the results of that software.

Lifelong learning has become essential in a fast changing world

Universities need to adapt and supply executive courses that will help graduates transition several times during the span of their careers.

The need for strong relationships between industry and academia

The relationship with industry is a cornerstone for the effective functioning of universities developing and delivering the critical skills for the future of work.



Human skills alongside digital skills

Many skills will become automated by digital technology, however, creativity, building enduring relationships and empathy are skills that will become the basis of the jobs of the future.

Expanding the focus beyond the built environment

Sustainable development requires looking beyond the built environment to consider other aspects such as environmental regeneration, increasing biodiversity, conservation of resources, stable economic growth and social progress.

Engineers have historically learned to evolve and adapt to the changing world

Engineers have always needed strong technical skills, and during the 20th century, they developed highly specialised skills to meet the infrastructure development needs of the time. In the future, they will continue to evolve and develop the digital and human skills that are required to achieve the low-carbon transition.



SKILLS CASE STUDY

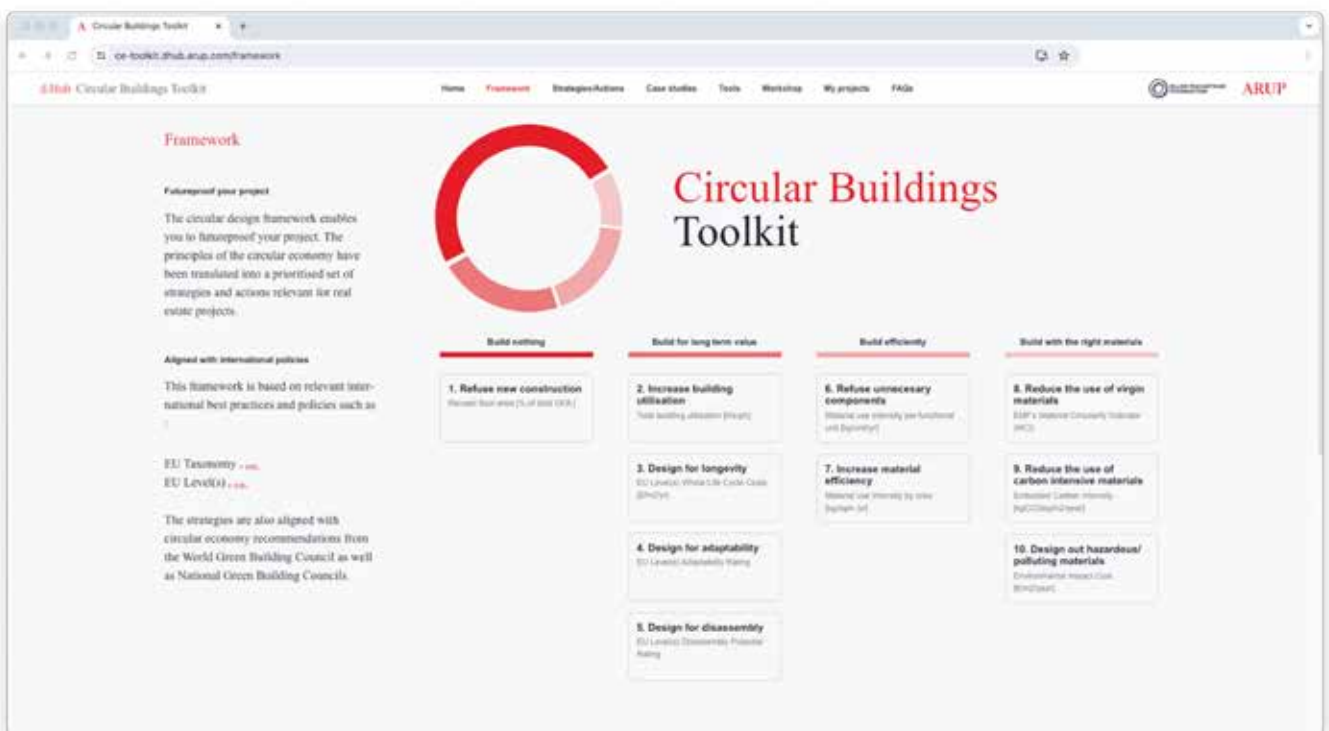
Circular Buildings Toolkit, Arup and Ellen MacArthur

This skills case study is an example of a learning resource for professionals aimed at bringing the circular economy for buildings into the mainstream.

The Circular Buildings Toolkit was developed to help designers and planners create a better future in the built environment sector. Arup and the Ellen MacArthur Foundation launched the toolkit in a bid to bring a circular economy for buildings into the mainstream, and future-proof assets in the face of a rapidly changing policy landscape.

The toolkit has taken the principles of the circular economy and translated them into a prioritised set of strategies and actions relevant for real estate projects. The toolkit adopts a high level framework – build nothing, build for long term value, build efficiently, and build with the right materials – which breaks down into strategies and detailed actions so that designers and planners can embed circular economy principles into the very beginning of new projects.

By applying the principles of the circular economy to the way we design buildings, infrastructure and other elements of the built environment, we can reduce greenhouse gas emissions, while creating urban areas that are more liveable, productive and convenient.



SKILLS CASE STUDY

Digital Twins Executive Masters, *Politecnica Madrid*

This skills case study is an example of the evolution of training targeted to engineering and design professionals.

The Executive Master in Digital Twins for infrastructures and cities is designed to train engineers and architects in the civil engineering and building sectors working in strategic areas such as transport, smart cities, mobility, energy, water and the environment.

The degree has an international aspect as is part of a joint degree awarded by the Universidad Politécnica de Madrid (UPM), École Nationale des Ponts et Chaussées (ENPC), İstanbul Teknik Üniversitesi (ITU), The Budapesti Muszaki és Gazdasagtudományi Egyetem (BME).

The program has been designed to provide industry professionals with comprehensive training in the technologies needed to plan, design, project, develop, implement, maintain and manage digital twins in the field of civil engineering and construction.

The masters degree culminates with a final project (Capstone Project) in which it is ensured that students will be able to develop significant contributions in the field of Digital Twins in civil engineering.



What strategies need to be implemented by the public and private sectors to incentivise the development and adoption of new technologies?

No sustainability, no digitalisation, no project

Innovation or applied research projects selected to receive funding should be the ones that assess their impact on the planet, and digital tools should be selected based on reaching planetary transition goals.

Innovation does not travel well

While science and technology scale and can be shared, innovation is much more challenging to transfer because it typically lives with people. Technology centres and hubs play a central role in connecting partners to knowledge and expertise and in developing innovative products that bring value to the marketplace.

The need to systematise innovation

We need to become better at planning for innovation and creating a process that can scale and be replicated across sectors and countries. Innovation, like marketing and accounting, needs to become another function within organisations with clear goals and accountability.



A common objective is needed to drive collaboration

Typically a core project or a problem is needed to drive collaboration, and with the increasing complexity of the challenges we face, collaboration becomes the natural path forward. No single entity can undertake to solve ambiguity on its own.

Digitalisation will facilitate the transition

Digitalisation enables several forms of transparency and the availability of data provides organisations with better means to guide their decision-making. There is a tremendous opportunity to accelerate the reduction of carbon emissions by 20% through digitalisation in the sector.



INNOVATION CASE STUDY

European Commission Innovation Fund

This innovation case study is an example of a funding program with a clear focus on supporting projects that assess their impact on the planet.

The Innovation Fund is one of the world's largest funding programs for the deployment of net-zero and innovative technologies. The Innovation Fund's goals are to:

- ✓ help businesses invest in clean energy and industry
- ✓ boost economic growth
- ✓ create future-proof jobs
- ✓ reinforce European technological leadership on a global scale.

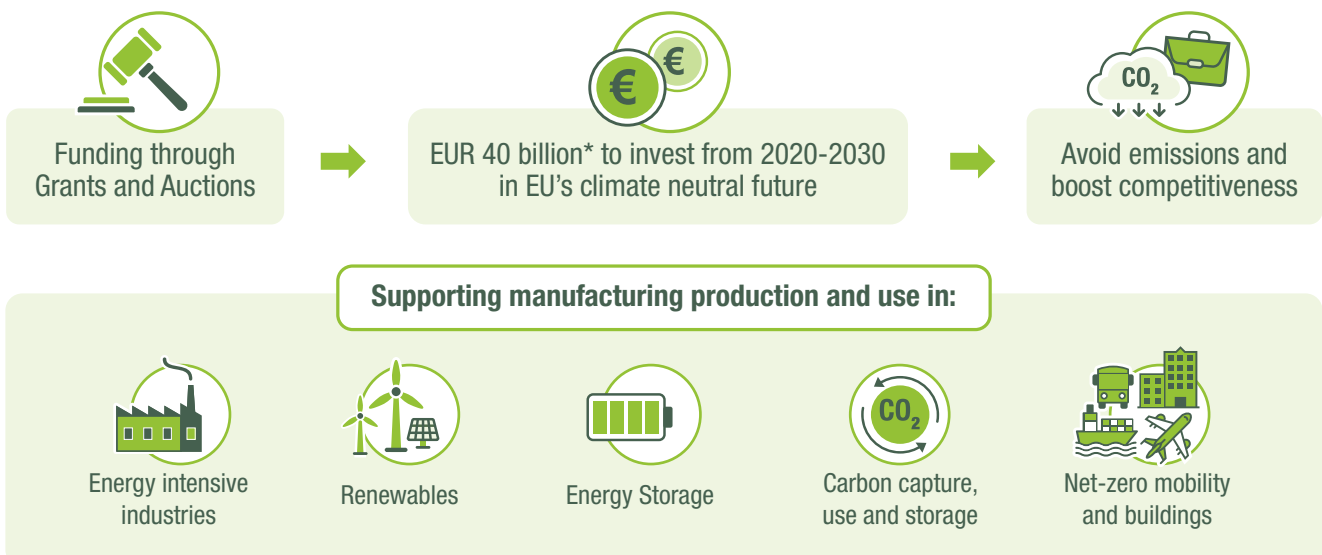
The Innovation Fund is the EU fund for climate policy, with a focus on energy and industry. It aims to bring to the market solutions to decarbonise European industry and support its transition to climate neutrality while fostering its competitiveness.

The Innovation Fund is a key funding instrument for delivering the EU's economy-wide commitments under the Paris Agreement and the climate and energy priorities put forward in the REPowerEU Plan, the Hydrogen Bank, the Green Deal Industrial Plan and the Net-Zero Industry Act

INNOVATION FUND

Deployment of net-zero and innovative technologies

Funded by EU Emissions Trading System



* based on a carbon price of 75 EUR/tonne

INNOVATION CASE STUDY

Eurecat Technology Centre

This innovation case study is an example of how technology centres and hubs play a key role in connecting partners to knowledge and expertise.

EURECAT offers applied R&D services, technological services, information technology consulting, highly specialised training and help in product and service development and promotion to industries and businesses. Eurecat also acts as a distributor of technological innovation across different levels.

EURECAT has expertise in 20 different technological divisions that are distributed in four major areas – digital, industrial, biotechnologies and sustainability – providing companies with the best products, services, platforms and processes to help them to be more competitive and at the forefront of advanced and sustainable economies.

EURECAT participates in over 200 national and international R&D&I high-level strategic projects and collaborates with 73 international patents and 9 technology-based companies.



How might we address the threats of increased energy consumption, e-waste generation, security breaches, and straining global supply chains and resources?

Virtual tools reduce risk and facilitate remote collaboration

The use of devices, such as virtual reality glasses, makes it possible to provide health and safety training for high-risk situations by simulating real-world risky scenarios.

These devices also make it possible for people in different locations to collaborate in real-time.



Leveraging digital technologies in the real world

Traditionally the goal has been to extend digital technologies across other sectors and in the future, digital technologies will be used in every sector to enhance and improve real-world activities. Collaboration between real and digital workers will increase.

AI will transform the way we work

AI is one of the most transformational tools in human history. The way we work will never be the same as certain aspects of human work become automated and new skills will need to be developed to facilitate human-computer collaboration.

The role of universities within digitalisation is critical

Universities will become critical for supporting the development of new skills as certain roles disappear and new jobs emerge. Universities will need to support knowledge transfer between humans and between digital workers.

Provides operational improvements

The use of digital twins enables companies to create simulations using real data to improve operations through the asset life cycle.



DIGITALISATION CASE STUDY

Mission Rooms, *Ferrovial*

This digitalisation case study is an example of leveraging digital technologies in the real world.

Mission Rooms creates 360 content, including immersive video, virtual tours and simulations for industry and education. The sustainable infrastructure company, Ferrovial, launched its digitalisation and virtualisation strategy, Infraverse, to bring together infrastructure and the metaverse.

The Infraverse brings together technologies such as virtualisation, augmented reality, AI, behavioural science, stakeholder engagement, simulation and digital twins, with robust data as a bedrock and a focus on the full asset lifecycle. Ferrovial has used the technologies to varying degrees on 10 major projects, and has generated 100 business cases.

The immersive technology is being used to both enhance user collaboration and to improve workforce safety.



ferrovial

Source: <https://www.bimplus.co.uk/ferrovials-new-digital-strategy-takes-infrastructure-into-the-metaverse/>

Series recommendations

Sustainability is mission critical

Sustainability needs to be considered in all of our activities to achieve the mission and goals we have set for our industry and for society to reduce carbon emissions.

The innovation ecosystem needs more development

Innovation is challenging to transfer locally and at a global scale. Individuals will need to learn how to integrate technology into their day-to-day work. Relationships with start-ups, suppliers and universities are important for realising innovation and digitalisation.

Partnerships to extend innovation into communities

It is important to bring together partnerships with universities and industry to extend innovation beyond projects and ensure that innovation permeates into the community.

It is incumbent on industry to engage in discussions with university and community partners to better understand what innovation and digitalisation mean for them.

Scaling up innovation

Cities and regions play an important role in scaling up innovation through their local investments and infrastructure planning. National governments must work with partners in implementing these solutions on a large scale, increasingly harnessing strategic partnerships among diverse sectors, academic institutions and communities to foster the innovation ecosystem's development.

Building skills for innovation

The speed of innovation cycles has accelerated and presents one of the greatest challenges for how we build up skills of the future to keep up with and adapt to the speed of innovation. The energy transition is moving faster than we realise, and we need to prepare our future talent to cope with the speed of change.



Looking forward



The insights shared in this series highlight both the challenges and opportunities in making the low carbon transition a reality in the context of Spain and Victoria bilateral relations. We see skills, innovation and digitalisation as key areas that require transnational cooperation.

As RMIT University's European Innovation Hub, we are committed to supporting the growing economic relationship between Spain and Victoria through partnerships in research and innovation, community engagement, education and talent solutions.

But there is still much more that can be done.

Infrastructure and the energy transition are pillars of the bilateral economic cooperation between Spain and Victoria with these sectors critical to the health and future of the Australian economy, more broadly.

As Spain's investment in Australia continues to grow, we must bring together industry, government and academia to work together towards the energy transition.

Our efforts need to go beyond sustainable practices and look to regenerative futures as a way of renewing and revitalising social, economic and environmental systems. From there and together we can build the future.

Thank you to all contributors for sharing their insights as part of this series.

Professor Marta Fernández, PhD, FIET

Executive Director and VC Innovation Professor, RMIT Europe

Future Europe Series roundtable Madrid, Spain 26 September 2023



L-R: Miquel Rey (Eurecat), Professor Alec Cameron (RMIT), Carmen Noguero Galilea (Instituto Cervantes), Carlos Blanco Seijo (Navantia), Australian Ambassador to Spain H.E. Sophia McIntyre, Gönül Serbest (State of Victoria's European Trade and Investment office), Marta Fernandez (RMIT Europe), Olatz Pombo (Arup), Marcos Garcia Alberti (Politecnica Madrid), Jesus Angel Garcia, (Indra), Laura Tordera (Ferrovia).

Acknowledgements



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Partners



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