Creating a Smart and Sustainable Island Strategy

European Islands and
Global Best Practices

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CONTENTS

THE SCOPE: EUROPEAN ISLANDS

Geographically, islands are territories smaller than continents, their main feature being that they are entirely surrounded by water. Islands are **diverse territories** but many face **common challenges** driven by their insularity.

The scope of this InfoBrief is European islands and the target audience is local and national authorities, solution providers, and civil society. Within this InfoBrief, European islands are defined as territories that are geographically located within Europe as well as overseas countries and territories located in the Atlantic, Antarctic, Caribbean, Indian, and Pacific Ocean. Many of these islands have existing connections as well as access to similar funding opportunities. The InfoBrief does, however, also draw on global examples of best practices to demonstrate the art of the possible.

The diversity of islands can be demonstrated through the **island typology** developed by the DAFNI Network of Sustainable Greek Islands. The typology highlights the diversity in terms of geography, independence, remoteness, economy, and resources. In Greece alone, you can see each of these types of islands.

Mainland Dependent
These islands have a high level of dependence on the mainland, including governance and funding streams.

Isolated
These islands are generally disconnected from the mainland whether politically, socially, or economically.
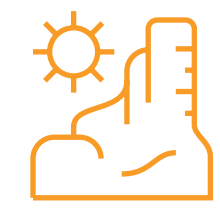
Independent
While disconnected from the mainland, these islands are flourishing and have established a competitive advantage.

Archipelagic
These islands often operate as a network sharing important assets such as airports.

Satellite
Reliant on a larger island hub for socioeconomic spill-over, including for public services such as hospitals.

The European Parliament adopted a **resolution on the special situation of islands** in 2016, which recognizes the unique challenges and opportunities faced by these territories in achieving sustainable development.

> Most islands depend on institutional funding such as the EU and, so, much activity reflects the concerns of the funding calls for infrastructure solutions around power, water, waste, and transport.

Kostas Komninos, General Manager, DAFNI Network of Sustainable Greek Islands

DEFINITION

Smart and sustainable islands harness digital technologies and data to drive better social, environmental, and economic outcomes for citizens, businesses, and visitors. Smart solutions should promote sustainable local economic development through the optimal use of local resources and enable islanders to acquire new skills, increase participation, and improve their interactions with public authorities.

Most islands are at the beginning of their digital transformation journey. They can learn lessons from the wealth of smart city solutions but should be mindful of their unique challenges and opportunities.

> "Islands need to be **technologically empowered**: This means using information technology as a vector of positive sociopolitical change centered on the promotion of citizens' interests, values, wellness, and dignity. Its goal is a participatory culture in which inclusion is a priority.
>
> **Dr. Gege Gatt, Board Member of the Humanity 2.0 Foundation (Rome), 2022**

> "A smart island ... creates **sustainable local economic** development and a high quality of life for the local population by implementing **smart and integrated solutions** to the management of infrastructures, natural resources, and the environment as a whole, **supported by the use of ICT**, all while promoting the use of **innovative and socially inclusive** governance and financing schemes.
>
> **Island Innovation Network, 2017**

> "There is no more defined area than an island. This means that all the solutions that we are developing for smart cities— resilience, SME diversification, energy, water, waste, broadband, circular economy, etc. — can work extremely well in an island context.
>
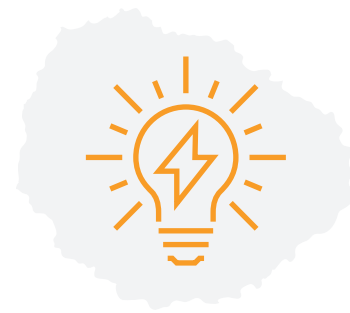> **Joe Dignan, Head of Government Insights Europe, IDC**

> "The key challenge for islands is to promote the development of **clusters and smart specialization strategies** while encouraging the development of **niche activities** in culture, eservices, food production, as well as the attraction of non-seasonal tourism.
>
> **European Parliament, 2021**

THE OPPORTUNITY

Islands as innovators

One of the greatest strengths of islands, particularly small islands, is that effective decisions can be taken quickly. With an effective governance function, people can be encouraged to become engaged in the formulation and implementation of policies and projects. This opportunity for cross-government collaboration provides a fertile environment for smart and sustainable solutions. Enabling technologies such as **cloud computing** have been a game-changer for islands. Islands no longer need upfront investment in large-scale datacenters. Instead, they can leverage on-demand and scalable computing services to drive innovation.

Islands as demonstrators

Islands provide a prime opportunity for large-scale demonstration projects. They offer a defined location to demonstrate the art of the possible. Forward-thinking islands have leaned into this and have taken steps to create an **innovation ecosystem**, including creating a legal and regulatory sandbox environment, investing in foundational technology and connectivity, strengthening digital skills, and promoting public-private partnerships.

Islands as a critical mass

Islands are not only interesting as a defined territorial unit — together they form a critical mass. There is no harmonized list but estimates indicate that there are approximately **2,400** inhabited islands across the EU member states. While islands are environmentally, socially, and economically diverse, many islands face common challenges and benefit from working together to innovate, access funding, and create economies of scale.

EU islands have access to multiple funding streams, including the **€806.9 billion*** NextGenEU Recovery instrument.

There are approximately **2,400** inhabited islands across EU member states, home to a population of over **20.5 million** inhabitants.

ESPON, 2019, and Eurostat 2020

"*Insularity leads to a degree of self-sufficiency in island communities. This may inspire creativity, since the small scale of most islands results in a relatively short path from 'thought to action'.*"
European Observation Network for Territorial Development and Cohesion (ESPON), 2019

"*Islands can function as testbeds for different innovative technologies in the sustainability area which then can be scaled up to towns and cities of continental Europe.*"
Smart Island Initiative, 2017

COMMON ISLAND CHALLENGES

" *Insularity gives rise to several challenges, but also endows islands with natural and cultural assets that are the foundations of development opportunities.*
ESPON, 2020

ECONOMIC DIVERSIFICATION AND COMPETITIVENESS

Quality tourism | Entrepreneurs | Industry DX

To be competitive, island economies often focus on a single sector, such as tourism, agriculture, or fishing. But these can be seasonally concentrated.

44% *Percentage of GDP from tourism before COVID-19 for the Balearic Islands. Tourist numbers are expected to rebound to pre-pandemic levels in 2022.* Balearic Islands Tourism Board, 2020

CONNECTIVITY

Digital access | Ports and marinas | People and goods

Islands are primarily characterized by a physical and digital disconnection from the mainland. Reliable and affordable connectivity is essential for an increasingly broad number of economic activities and services.
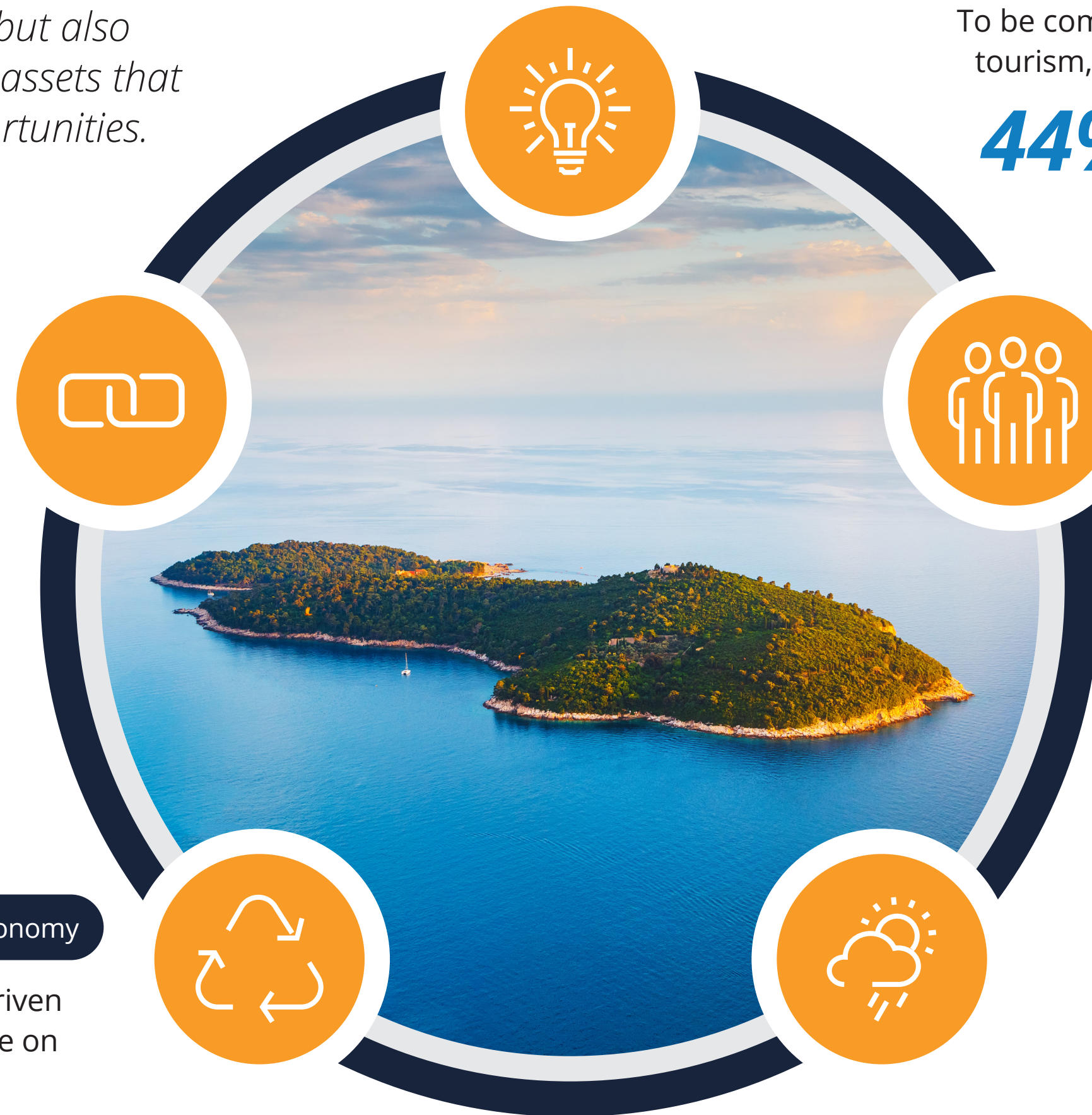
6%–12% *Amount by which regional GDP could be increased by closing the digital access gap between the Caribbean islands and more advanced economies.* IDB, 2022

RETAINING AND ATTRACTING ISLANDERS

Upskilling | Quality services | Community driven

Islands often face depopulation and brain drain. Many also struggle to provide access to government services, transport, health, and education, reducing the quality of life and attractiveness.

~40% *Youth unemployment in the French ORs and Canary Islands in 2019* Eurostat

RESOURCE MANAGEMENT

Energy | Water | Waste | Biodiversity | Circular economy

Management of waste, water, and energy can be a challenge, driven by depletion of resources, unsustainable tourism, heavy reliance on imported goods, and diseconomies of scale.

10 *Factor by which cost of energy generation on islands can be higher than on the mainland.* European Commission, 2021

RESILIENCE AND CLIMATE

Climate and disaster risk | Mitigation | Adaptation

Islands are highly vulnerable to climate change, extreme weather events, freshwater and land scarcity, and rising sea levels. It can be a challenge to provide post-disaster assistance, particularly to the outermost islands.

5 days *The length of the communications blackout in Tonga caused by the February 2022 eruption of the Hunga Tonga volcano. It took 5 weeks to restore internet connectivity.* Euronews, 2022

THE ART OF THE POSSIBLE: CONNECTIVITY

Islands are primarily characterized by a physical and digital disconnection from the mainland.

Smart and sustainable island solutions require fast and reliable internet connectivity. Providing internet to islands has been notoriously challenging. However, it is fundamental for an increasingly broad number of economic activities and services, including facilitating island-based industries such as agriculture, tourism, and finance; enabling **digital nomad** programs; and ensuring access to citizen services. **Several islands have recognized internet connectivity as a top priority.**

Digital technology can also play a key role in creating more efficient and **effective transport links for visitors and residents**, including the development of **smart marinas and ports**. The deployment of eservices can also reduce the need for islanders to jump on a boat to access services such as healthcare and education.

> " *The premier enabling technology is connectivity. Jersey has the fastest broadband internet in the world. This enables it to compete for FDI, grow indigenous companies, and offer itself as a sandbox for innovation.*
>
> **Tony Moretta, CEO, Digital Jersey, 2022**
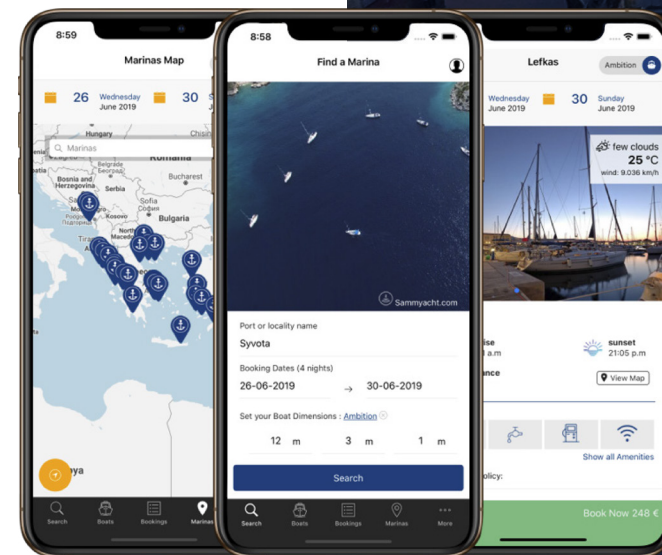
Arranmore: Internet Connectivity Enabling Business and Citizen Services

In 2017, in the face of a declining population, Arranmore Island Community Council in Ireland launched project **#Cominghome** and asked the Arranmore diaspora what was needed to make the island a place they would consider returning home to to live. Internet connectivity was identified as a top priority. With funding from the national government, and in partnership with a telco, the island established reliable internet connectivity and **Ireland's first offshore digital hub** with high-speed internet, office space, state-of-the-art videoconferencing facilities, and ocean views.

Many local businesses in Arranmore are now thriving — local talent includes graphic designers, games developers, and app developers. The council also has its eye on **digital nomads** and has written an **open letter to the people of America** declaring the island ready for business:

> " *You'll have the best diving in Ireland on your doorstep and seafood to rival the tastiest New England chowder. There are fewer people here than would fit in a couple of Amtrak carriages, but enough musicians and good Irish whiskey to keep the party going well into the night.*

Citizen services have also been improved. The health center can now provide telemedicine appointments (which are critical for connecting patients to specialists on the mainland) and is piloting **an IoT solution for elderly citizens** living on remote parts of the island. **Read more here**

Smart Marinas in Greece and Cyprus

Globally, more than 85% of marinas and tourist ports have low levels of technology and digital services. Across Europe, there are approximately 4,500 marinas[1] representing a €15 billion market with an annual growth rate of 6% (pre-COVID). The SaMMY platform, developed with funding contributions from the European Commission[2], taps into this opportunity. SaMMY combines technologies and tools to provide real-time information to sailors and marina managers on weather and sea conditions, warnings, and booking options. The system includes a network of sensors linked to a cloud-based FIWARE Context Broker (a platform to manage and share integrated data) with data feeding into a mobile app and marina management dashboard. It is currently operating in 36 ports across Greece and Cyprus with plans to scale to more than 300 marinas. **Read more here**
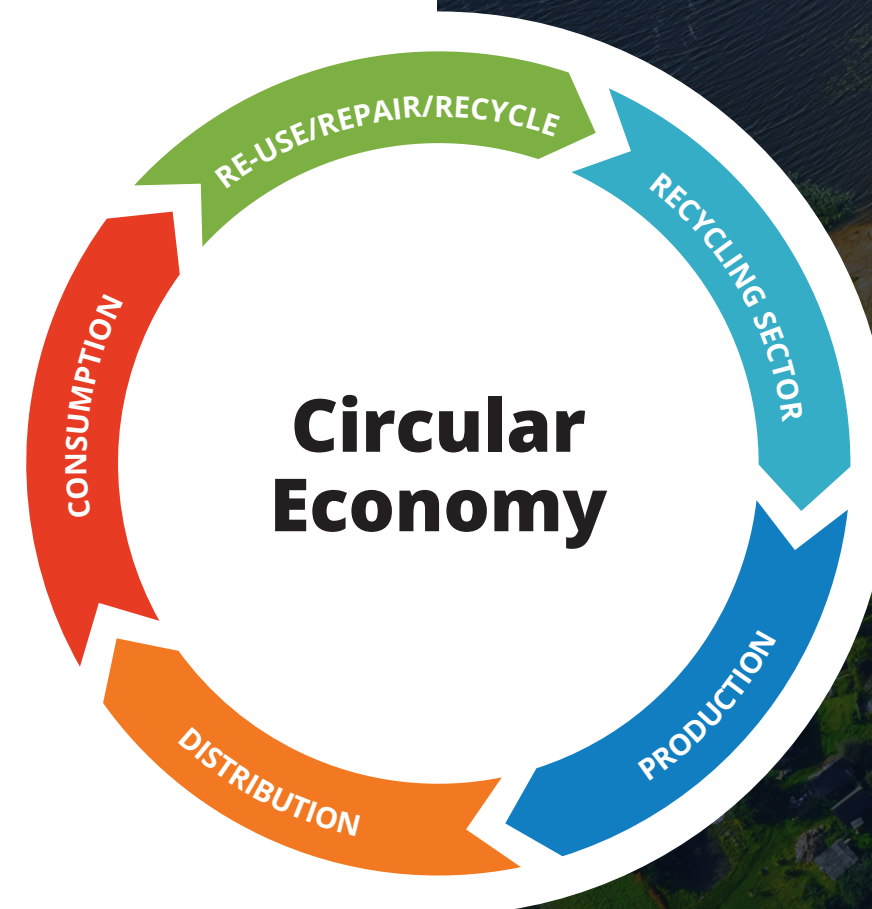
THE ART OF THE POSSIBLE:
RESOURCE MANAGEMENT

Islands face unique challenges when it comes to managing local resources, including **water** and **energy**, processing **waste**, and **conserving the environment**. These challenges are often driven by finite resources (such as groundwater), unsustainable tourism, heavy reliance on imported goods, and diseconomies of scale.

However, islands also have clear advantages, including an abundance of renewable energy sources and high levels of biodiversity. **Circular economy** principles — a model of production and consumption that minimizes waste — are particularly relevant for islands since they must **optimize the use of local resources with finite space**.

Several islands are leveraging digital technology and data to more effectively and **sustainably manage their resources**, whether using drones for environmental monitoring, IoT networks for water and waste management, or smart energy grid technologies.

> *Islands are living laboratories since they optimize the use and management of local resources and infrastructures.*
> **European Economic and Social Committee, 2017**

> *The EU's overseas regions host 70% of the EU's species and 30% of the world's coral reefs.*
> **International Union for Conservation of Nature, 2020***

Circular Economy

RE-USE/REPAIR/RECYCLE
RECYCLING SECTOR
PRODUCTION
DISTRIBUTION
CONSUMPTION

Gotland: A Testbed for Smart and Renewable Energy

Over the past decade, Gotland in the Baltic Sea has positioned itself as a **testbed for experimentation in renewable energy. Smart Grid Gotland** (SGG) (2012–2017) was a large-scale demonstration, research, and development project, funded by the Swedish Energy Agency to test smart grid technology which could later be replicated in Sweden and beyond. The aim of the project was to increase capacity for renewable energy, including wind and solar, improve the quality of power on the island by detecting system bottlenecks, and roll out smart meters. Among other outcomes, the project achieved a **20% reduction in outages** as well as a decrease in power spillages (waste) during distribution grid downtime. Since the SGG project ended, the island has remained a testbed for the green energy transition. Ongoing projects include **Smartroad Gotland**, testing seamless charging of vehicles while traveling on a road, and **Gotland Industrial Symbiosis Park**, a circular-economy-based innovation hub. **Read more here**

The Balearic Islands: Build a Circular Economy

The Government of the Balearic Islands has developed a tourism strategy (2022) along with a new legal framework and investment of **€55 million** (partly funded through the **NextGenEU** Resilience and Recovery Funds). The goal is to make the islands more sustainable and circular covering aspects such as food, water, waste, and clean energy. Under the new regulations, all businesses will be required to have a **circularity plan**. In Mallorca, the government in partnership with the island's business associations and academics has established a **Circular Hotel Initiative** whereby major hotels, the main producers of organic waste on the island, must purchase a ton of local produce for every ton of organic waste they produce. This creates an incentive to minimize waste while also supporting the local agriculture industry which was heavily impacted during the pandemic. Other islands are interested in replicating the initiative. **Read more here**

THE ART OF THE POSSIBLE:
RETAINING AND ATTRACTING ISLANDERS

Innovative islands are **experimenting with new models and tools** to retain and upskill their citizens and attract new talent to contribute to the community and economy. The trend toward remote workers and digital nomads has been on the rise over the past five years but has accelerated dramatically due to the pandemic. Some islands are looking to tap into this market by creating a **differentiated value proposition**.

On some islands, particularly remote and outer islands, access to **government services** such as healthcare, education, and public transit is limited and can reduce the **quality of life for islanders** and **attractiveness for newcomers**. Some islands are leveraging digital technology to improve the quality and accessibility of citizen services.

> *An important challenge for islands is to keep and attract talent. For islands to be sustainable, economic diversification, skills, and talent are fundamental to ensure a good balance. The lack of career opportunities generates problems for the future.*
>
> **Dolores Ordóñez, Smart Island Expert in the Balearic Islands, 2022**

> *Remote work programs, if managed effectively, can benefit islands by reducing brain drain, contributing to the local community and innovation ecosystem, and diversifying the island's economy. Five key factors for attracting remote workers are (1) the visa system (2) the internet (3) the community (4) accommodation (5) safety.*
>
> **James Ellsmoor, CEO Island Innovation, 2022**

The **@HOME in Curaçao** program is attracting remote workers and companies. Its value proposition includes no work permit or taxation for remote workers, a simple digital application process, high-speed internet, a state-of-the-art hospital, and a thriving art scene.

The Digital Academy on Jersey offers part-time and higher education courses in digital technology. The objective is to retain and upskill local talent including both young islanders and industry professionals. The academy feeds into the island's broader innovation ecosystem.

Caribbean islands are using social media to engage with their **global diaspora** through identity, affinity, and community with a view to encouraging them to take an ambassadorial role and help with funding and investment or even to come and live and work in the Caribbean.

Malta: Improving Island Citizen Services

Saint James hospital in Malta is using digital technology to provide more **empathetic and efficient healthcare services**. The hospital has implemented an end-to-end patient engagement solution represented through a virtual agent that can understand and respond to natural language conversations in several languages across multiple channels (voice, messaging, web, SMS). Innovating healthcare services is particularly important for islands as demand often exceeds capacity, they can face skills shortages, and they often have hard-to-reach citizens in remote locations and, in some instances, aging populations. Multilingual tools can help to make services available to new or temporary islanders, whether Erasmus students, tourists, or migrants. **Read more here**

THE ART OF THE POSSIBLE:
ECONOMIC DIVERSIFICATION AND COMPETITIVENESS

It can be argued that islanders are naturally conservative and have a culture of self-sufficiency and resilience. Traditional tourism models globally have had a system shock that will drive creativity around economic diversification and competitiveness. The traditional axiom of relying on consulting citizens to find out what they want presupposes that island citizens know what is possible. Agencies need to build into the consultation process a portfolio of best practices to inspire and challenge.

> *The concepts behind Underwater Gardens offer to turn tourism and marine technology into a social, cultural, and natural force for good. Just as the gardens of the Renaissance evolved from places for entertainment to being the crucible for new scientific discoveries, Underwater Gardens will encourage curiosity with science by igniting the virtuous circle of the 3Es — edutainment, economy, and ecology.*
> **Marc Garcia-Duran Huet, Executive President and Founder, Underwater Gardens, 2022**

> *Tourism can become a self-destructive industry, a specific phenomenon where tourism starts to cannibalize itself by destroying that which makes a destination attractive in the first place.*
> **Bonnie Lewtas, International Sustainable Tourism Expert, 2022**

> *Productivity — GVA — is a key measure on islands. With a small population, we need workers doing the highest value jobs we can achieve.*
> **Tony Moretta, CEO, Digital Jersey**

Underwater Gardens

The Canary Islands will host the world's first underwater garden park comprising **sustainable and regenerative smart enhanced reefs**. **Underwater Gardens International** (UGI) combines science, technology, sports, education, and arts to **restore marine ecosystems, raise awareness of the importance of healthy oceans, and promote regenerative and sustainable coastal tourism. The gardens are aligned with the EU's Blue Growth Strategy and the UN's Strategic Development Goals (SDGs)** while also offering divers of all ages and ability the next generation of underwater experience. **Read more here**

Jersey: Using Agritech to Improve Yields

Jersey has **three major economic activities: finance , tourism, and agriculture**. It has an international reputation for Jersey dairy produce and Jersey royal potatoes. Digital Jersey, in consultation with local farmers and working with local telcos, **designed and operates a data-gathering drone system that monitors the health and growth of produce**, even when it is under plastic, and this feeds into a database where it is analyzed to **optimize the yield. Read more here**

THE ART OF THE POSSIBLE: RESILIENCE AND CLIMATE

Islands are vulnerable to climate change and extreme weather events. They are particularly vulnerable to freshwater and land scarcity as well as sea-level rises.

While **many islands are vulnerable to climate change, they can also be champions of resilience**. They have growing experience in disaster prevention, climate change adaptation, and the green transition. Some islands have leveraged digital technology and data to help build their resilience and continue to experiment in this space.

> *Islanders are naturally resilient and have dealt with natural change for generations. An added element of climate resilience is that it provides an opportunity for islanders to demonstrate leadership.*
> *Island Innovation, 2018*

Zanzibar: Mapping and Monitoring Climate Risks with Drones

The Government of Zanzibar has created a **high-resolution map** of the Zanzibar islands (over 2,300km²) using **low-cost drones**. The maps are being used to support better planning and environmental monitoring, including **flood risk**. The project included **training local university students** in geographical information systems, environmental impact assessments, and drone technology. Some islands are piloting drone technology to increase their resilience by monitoring **sea-level rises** to the increasing risk of **wildfires**. **Read more here**
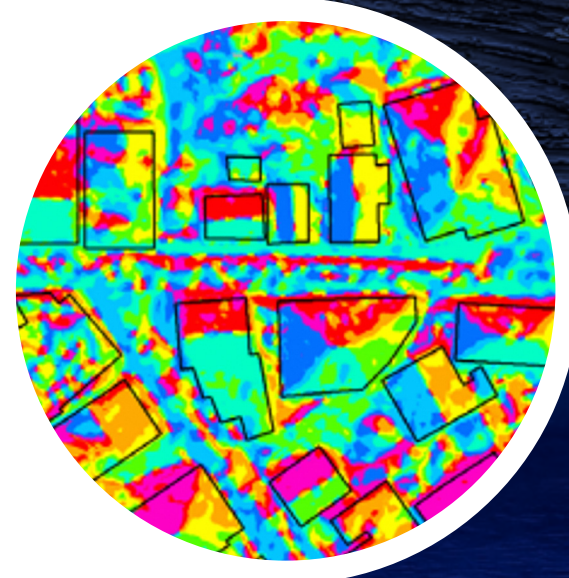
Caribbean: Assessing Vulnerability and Reducing Risk with ML

In Saint Lucia, drones and machine learning have been used to assess the hurricane vulnerability of buildings. An ML algorithm was developed using data from a damage assessment conducted in neighboring Dominica. Characteristics such as roof material, shape, and size were used to predict the vulnerability of structures. This household level information is being used to inform decision making and implement targeted risk reduction activities. Machine learning can also be applied to other resilience use cases including targeting high-risk buildings for inspection, post-disaster assessments, and environmental monitoring. **Read more here**

Japan: Pioneering Research to Use Robots for Disaster Response

As recently demonstrated in **Tonga**, it can be very challenging to get "eyes on the ground" and provide post-disaster assistance to islands, especially remote islands. Japan, which is particularly vulnerable to natural hazards, is pioneering the use of robots in disasters. The Human-Robot Informatics Laboratory in Tohoku University has developed several robots for disaster response, including a snake-like robot with a camera that can crawl over obstacles and a search-and-rescue "dog" equipped with cameras and GPS. **Read more here**
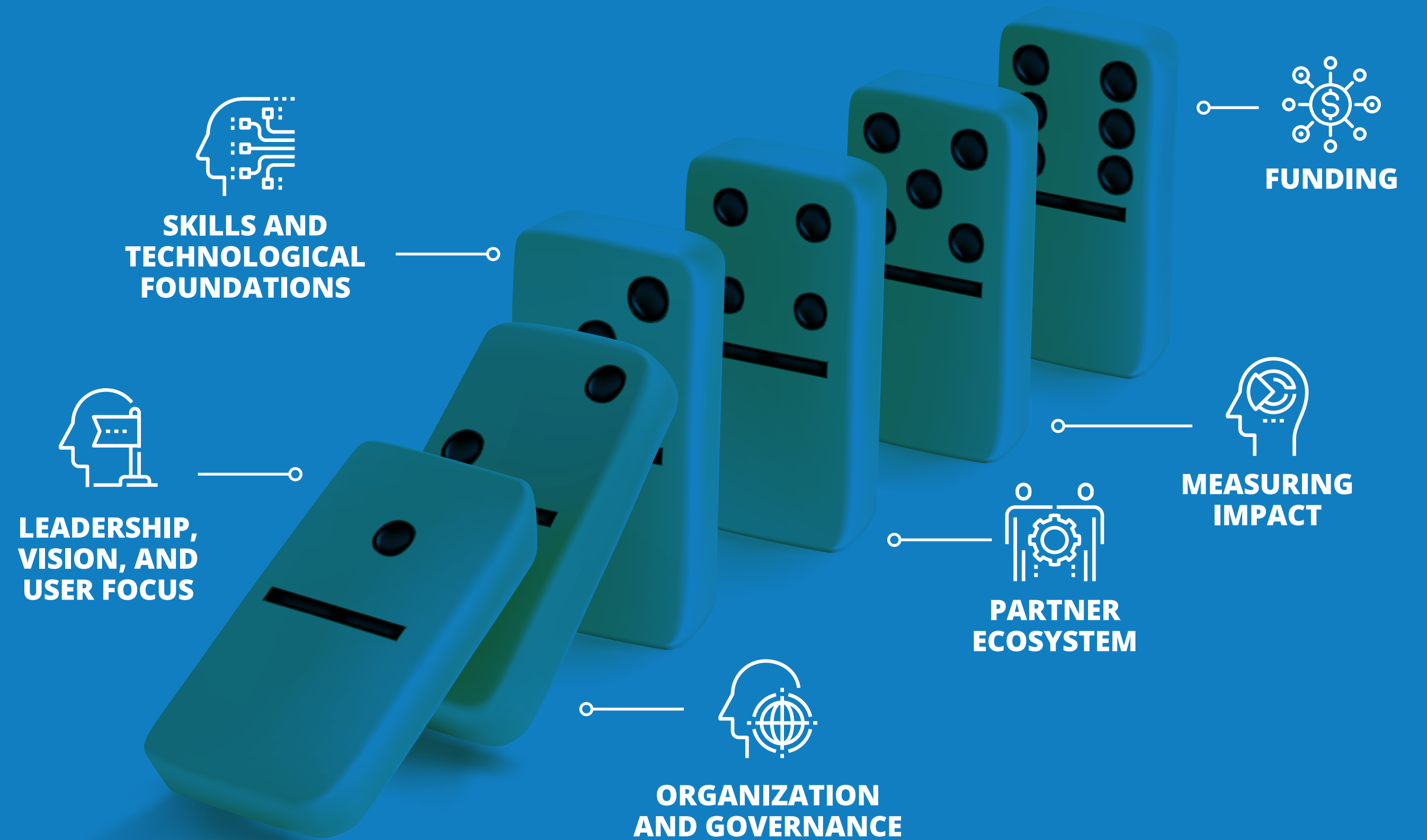
CREATING A SMART
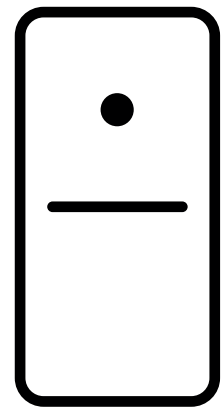AND SUSTAINABLE
ISLANDS STRATEGY

GUIDING PRINCIPLES FOR CREATING A SMART AND SUSTAINABLE ISLANDS STRATEGY

Experience has shown that to create a **successful smart islands strategy**, agencies need to follow a particular sequence of activities to maximize results. If an activity focus is missed or is out of sequence, it will adversely affect the whole program. The following slides provide a deep dive into each island domino.

These island dominoes are all situated within, and either enabled or constrained by, the island's broader **policy and regulatory framework**. This landscape will differ from island to island but there are best practices for creating regulatory environments conducive to innovation.

The **Island of Innovation Project**, a partnership of seven European islands, created a **guidebook** to assess and benchmark innovation governance. The book is being converted into a digital train-the-trainer resource and will be piloted in the Azores from April 2022.

SKILLS AND TECHNOLOGICAL FOUNDATIONS

LEADERSHIP, VISION, AND USER FOCUS

ORGANIZATION AND GOVERNANCE

PARTNER ECOSYSTEM

MEASURING IMPACT

FUNDING

LEADERSHIP, VISION, AND USER FOCUS

The Leadership and Vision Must Be User Focused and Directed Toward Concrete and Realistic Outcomes

Vision: There must be clarity of vision. Determine the outcomes you are looking for. Understand what it is you need, such as skills, investment, and technology. And know how you will measure the impact of the effort. In all the above, be realistic — not every island will be the new Singapore.

Leadership: Picking the right leader is critical. Often the role is given to someone as an adjunct to their existing role and fails to have an impact. The role should reflect the current thinking around the chief digital officer role and its ability to holistically integrate internal and external stakeholder needs.

User focus: Consult with and understand the needs of those who are not directly connected to the organization, whether citizens, businesses, or civil society, but are still interested in or could be impacted by the activities. **Is what you are doing something they want, and will it be delivered in a way that it will be used?**

> **" The Greek national strategy for islands could be a draft of an institutionalized European program for islands.**
> **Island Commission, 2021**

> **" Our vision is to create a government that is 'Digital to the Core, and Serves with Heart.' A digital government will be able to build stakeholder-centric services that cater to citizens' and businesses' needs.**
> **Singapore's Digital Government Blueprint, 2020**

Greece: Scaling Impact with a National Strategy for Islands

In 2021, the Greek parliament passed a bill that mandates the creation of a national strategy for the sustainable development of islands. The legislation recognizes islands' distinctive features and the advantage of bringing together fragmentary interventions into a holistic strategic approach to scale impact. The legislation also covers funding programs for sustainable infrastructure and island entrepreneurship.

Singapore Is the Island by Which All Others Are Judged

Singapore has evolved over the past 63 years from being a colony to being a global economic powerhouse and the smartest city-state in the world. As such, it is a perfect exemplar for the guiding principles outlined in this InfoBrief. As ever, it starts with a major challenge with Singapore facing expulsion from the newly formed Malay Federation in 1965 and having to create a new vision for the island and its people regarding its place in the world. The response was to appoint an inspirational and radical leader in Lee Kuan Yew, who led the country for 31 years. The next stage was to set an ambitious digital vision first outlined in the egovernment plan of 2000 and regularly updated since to be number 1 in driving economic and social value through digital technology. The mantle was taken up by Prime Minister Lee Hsien Loong, who initiated Singapore's Smart Nation Programme in 2016. The government has invested heavily to create a shared agenda and long-term strategy through a comprehensive partner ecosystem that includes business, academia, and citizens. The focus on digital transformation governance has encouraged adoption in both the private sector and the population. Education is seen as a key enabler with the island launching a three-year program to teach computer programming to 500,000 young people and an assistance program to upskill those in the workforce (SkillsFuture).
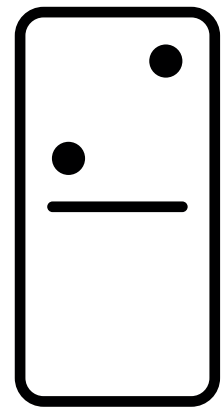
ORGANIZATION AND GOVERNANCE

The Governance Model Will Be Crucial to Ensure Momentum and Consistent Execution That Transcends Political Cycles

Special Purpose Vehicle

Creating the right special purpose vehicle (SPV) to drive change on an island provides real competitive advantage. Remote National Government Intervention is exactly that: remote. Any organization that can be affected by the vagaries of election cycles will have difficulty providing consistent, strategic direction, resources, and funding. Many successful island communities have set up arm's-length multistakeholder SPVs, usually majority-owned/funded by government that operate with agility, consistency, and local knowledge. They can also become revenue centers rather than cost centers by attracting private sector funding and bidding for institutional funding such as the EU.

> *Everything is interrelated on islands. More businesses mean more jobs but also more hotel rooms and flights. In turn this means more hotel accommodation for tourists and allows more opportunity for the islanders to travel freely and cheaply.*
>
> *Tony Moretta, CEO Digital Jersey, 2022*

> *Vision, momentum, and consistency are critical to developing smart and sustainable islands. In Mallorca, all political parties signed up to a charter promoting the concept, thus allowing for continuity independent of political change.*
>
> *Dolores Ordóñez, Smart Island Expert in the Balearic Islands, 2022*

Digital Jersey

Digital Jersey is a government-backed economic development agency and industry association dedicated to the growth of the digital sector on Jersey. They develop strategies to help on-island industry thrive and remove barriers for inward investors choosing Jersey as their base for digital innovation. The Hub has 700+ members and 133 graduates from its digital academy, and has contributed to 3,000+ people in digital positions across the island. With this institutional setup, it has established and sustained nine key initiatives on the island.

Internet of Things
IoT and smart technologies

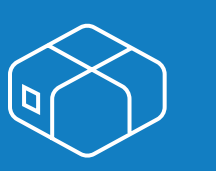**Fintech & Regtech**
Fintech and regtech cluster

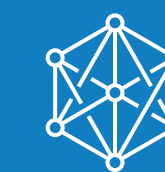**Digital Health**
New health technologies
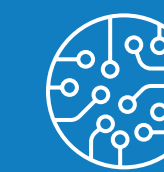
Working Permissions
Access talent to grow

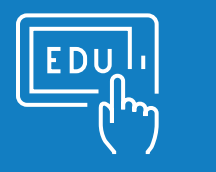**Start-up Support**
For entrepreneurs within the EEA

Sandbox Jersey
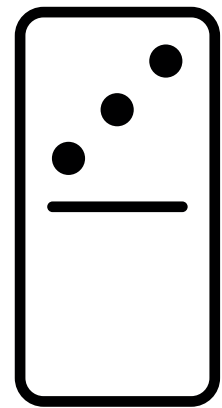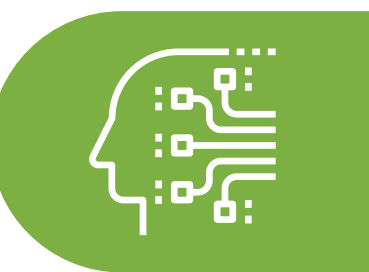Testbed infrastructure for new tech

DJ Hub
The center of Jersey's tech community

DJ Xchange
Internet of Things and DJX facility

Digital Jersey Academy
Center of excellence for digital education

SKILLS AND TECHNOLOGICAL FOUNDATIONS

The Twin Foundations of Success Are the Tools to do the Job and the Skills to Manage the Process

Skills

The public sector is not overendowed with digital skills, and islands have even more of a challenge. Equally, technology changes quickly: cloud, AI, ML, VR, edge, digital twins, and drones are now mainstream. Islands need to map required skills to the outcomes sought and partner with the private sector to fill gaps and upskill the local workforce.
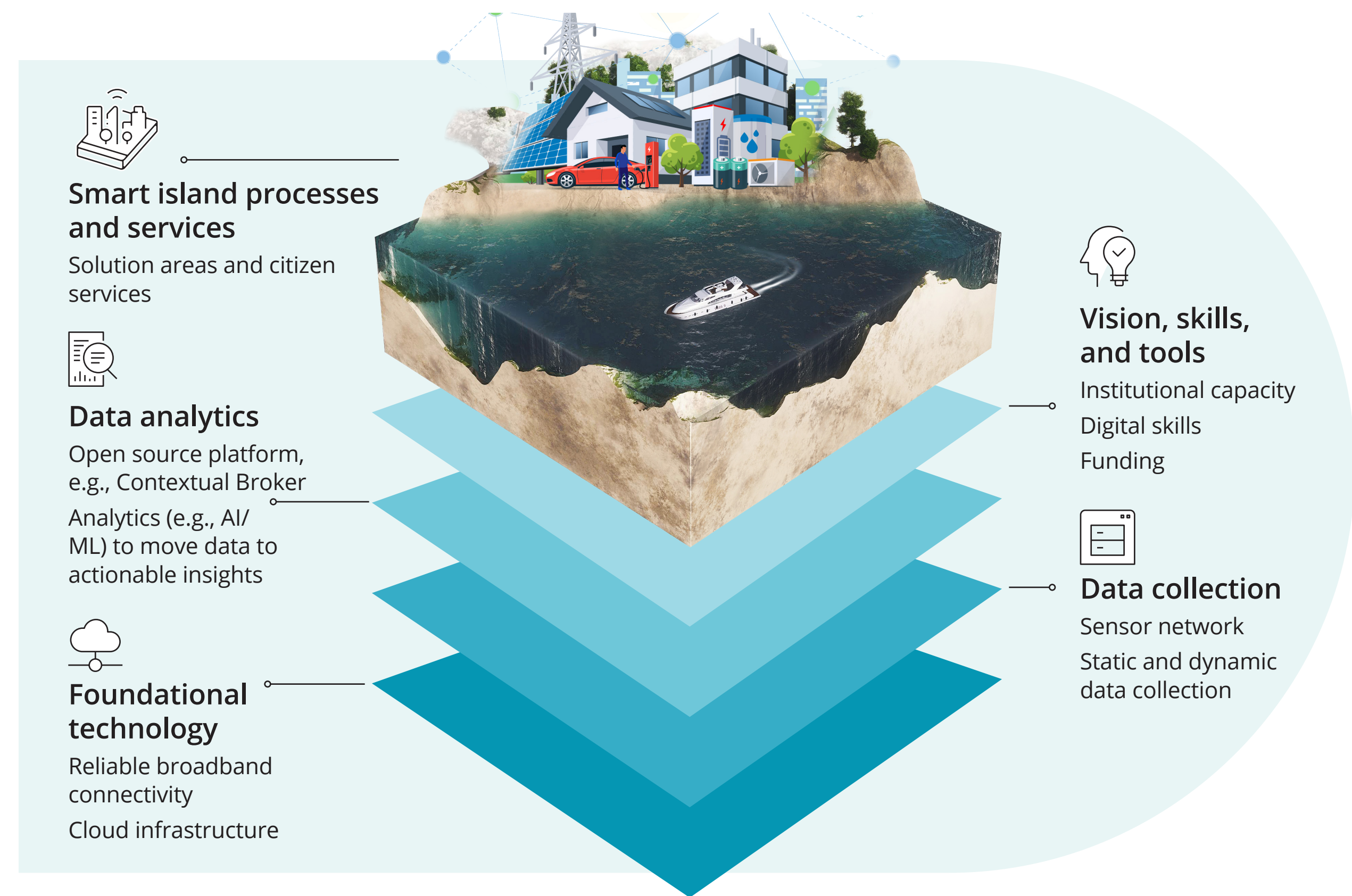
Data and Technology

There is often push back from community groups that champion the view that change should be people led and not technology led, but It is not a binary question. Technology is the facilitating infrastructure that enables change. Without connectivity, often described as the fourth utility, the citizen-centric solutions that can be built on top of it will not happen. More importantly, technology such as cloud enables islands to compete in the global market by providing access to secure, affordable, and scalable compute and technology resources.

> " *A data-driven platform based on an IoT network is being developed in Mallorca. It is an open-cloud-based platform, built on FIWARE, including a context broker, so that it can link to data spaces and smart solutions across several domains.*
>
> Dolores Ordóñez, Smart Island Expert in the Balearic Islands, 2022

Smart island processes and services
Solution areas and citizen services

Data analytics
Open source platform, e.g., Contextual Broker

Analytics (e.g., AI/ML) to move data to actionable insights

Foundational technology
Reliable broadband connectivity
Cloud infrastructure

Vision, skills, and tools
Institutional capacity
Digital skills
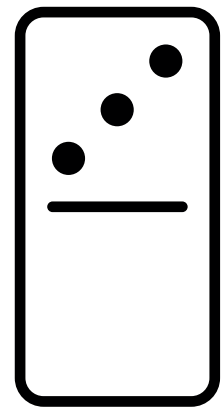Funding

Data collection
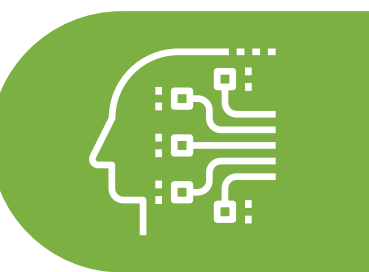Sensor network
Static and dynamic data collection

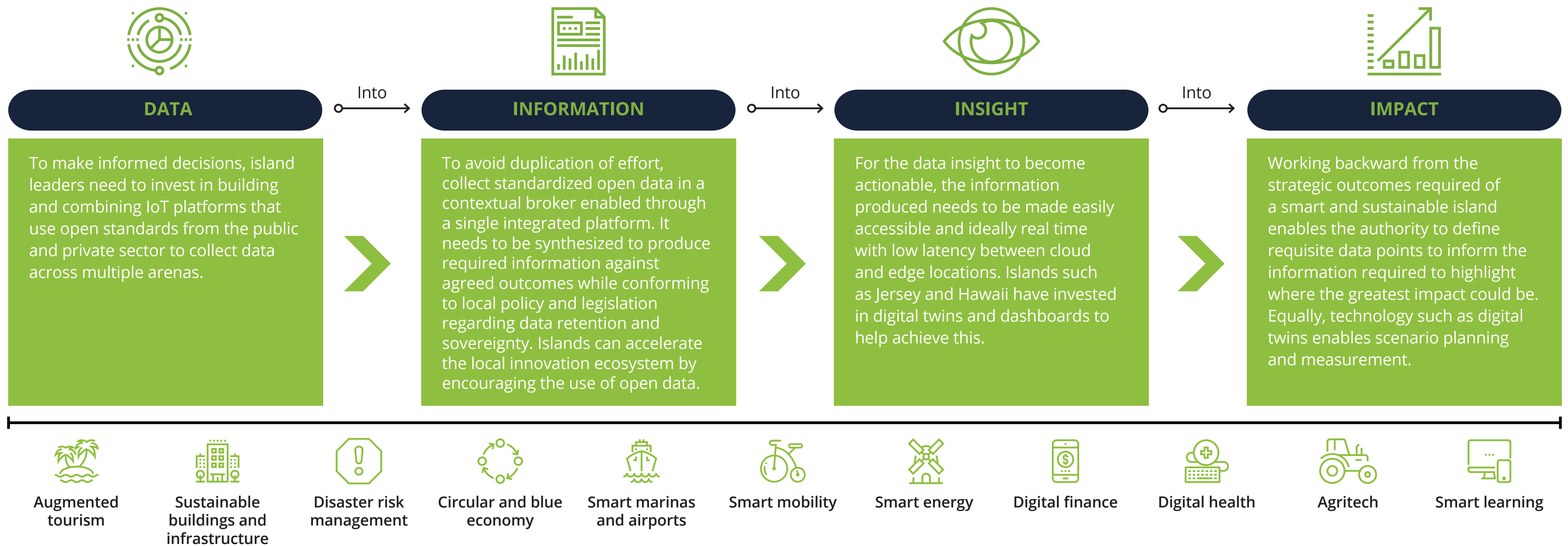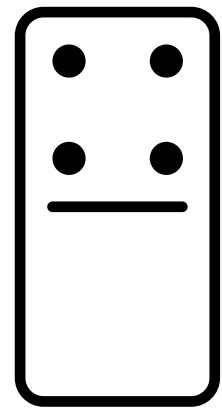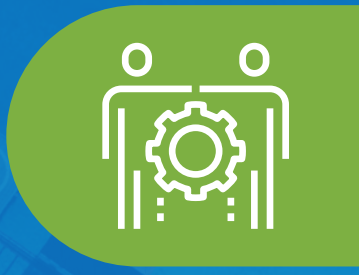Service Partners
Software Partners
Training Partners
Hardware Partners

SKILLS AND TECHNOLOGICAL FOUNDATIONS

Islands need to move beyond point solutions to holistic digital strategies that use data to drive decision making. This flow of data should underpin all smart island initiatives and enable integration across solutions.

DATA	Into	INFORMATION	Into	INSIGHT	Into	IMPACT
To make informed decisions, island leaders need to invest in building and combining IoT platforms that use open standards from the public and private sector to collect data across multiple arenas.		To avoid duplication of effort, collect standardized open data in a contextual broker enabled through a single integrated platform. It needs to be synthesized to produce required information against agreed outcomes while conforming to local policy and legislation regarding data retention and sovereignty. Islands can accelerate the local innovation ecosystem by encouraging the use of open data.		For the data insight to become actionable, the information produced needs to be made easily accessible and ideally real time with low latency between cloud and edge locations. Islands such as Jersey and Hawaii have invested in digital twins and dashboards to help achieve this.		Working backward from the strategic outcomes required of a smart and sustainable island enables the authority to define requisite data points to inform the information required to highlight where the greatest impact could be. Equally, technology such as digital twins enables scenario planning and measurement.

Augmented tourism Sustainable buildings and infrastructure Disaster risk management Circular and blue economy Smart marinas and airports Smart mobility Smart energy Digital finance Digital health Agritech Smart learning

PARTNER ECOSYSTEM

Initiatives Will Depend on an Ecosystem of Solution Partners

Partners

Islands need to build an ecosystem for innovation. This requires collaborating with a variety of partners from the public sector, civil society, academia, and private sector. Islands must identify what each partner can contribute to the ecosystem.

Island Networks

Islanders have a strong sense of identity, shared culture, and independence. They need to leverage the best of those attributes and collaborate with **island networks**. Island networks have different modi operandi, including knowledge sharing, advocacy, diplomacy, institutional and policy integration, and coordination of funding and multistakeholder programs.

> *Technology companies can provide support through technical expertise, skills transfer, and their partner network.*
>
> *Joe Dignan, Head of Government Insights, IDC*

> *The integral power of island networks is the legitimacy of peer-to-peer learning to drive a desire to trial new things. There is a feeling that solutions being deployed in cities, such as London, are not suitable for the island context so they can share ideas and solutions appropriate to their situation.*
>
> *Kate Brown, Executive Director, Global Island Partnership*

How can tech companies support island innovation?

Service Partners

Provide end-to-end solutions to customers at any stage of the digital transformation journey — from consultation on initial solution design, to building applications, through to ongoing optimization and support. They create and integrate the systems and hardware that enable access to data and specific solutions.

Software Partners

Build solutions custom designed for the specific challenges defined by island strategies. They also deploy analytics and AI to generate insight for actionable results.

Hardware Partners

Provide islands with the devices required to collect data at source. These can be sensors or remote monitoring devices that ensure interoperability, real-time access and response, and plug and play capabilities.

Training Partners

Focus on reskilling and upskilling local teams and the community. They enable continuous access to the "art of the possible" through technology and help the community understand the benefits of digital transformation.

Greece: DAFNI Network of Sustainable Greek Islands

DAFNI is a non-profit organization of 55 island local and regional authorities. The network provides technical and consulting services to its members and is a key partner in the design and implementation of European projects across the islands in areas such as renewable energy, youth employment, and the circular economy. DAFNI also coordinates the Smart Islands Initiative, a bottom-up effort of European island authorities and communities which seeks to position islands as laboratories for technological, social, environmental, economic, and political innovation.
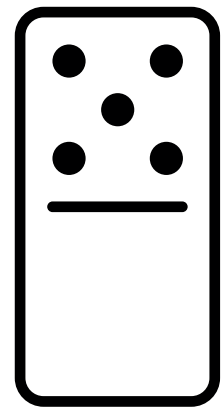
MEASURING IMPACT

Select Projects Where Success Can Be Measured to Help Ensure Additional Investment and Future Projects

Increasing Insights and Assessing Impact

Island projects appear and then disappear at an alarming rate. The main cause of "projectitis" is that there is no impact assessment. It is virtually impossible to justify further investment in a program unless you can prove the benefits. When developing the initial business case islands must know what success will look like and the metrics by which it can be judged. Not all projects, particularly on islands, will have a monetary RoI and they should look at new, developing metrics that capture social and environmental value.

> *There is a dearth of data on islands. To gain a better understanding of the situation on the ground, more granular social, environmental, and economic data is needed. This will provide a baseline to measure project impact and build a business case for project continuation.*

Louisa Barker, IDC Government Insights

> *We are going to stop measuring the success of the Spanish tourism model exclusively by the increase in the number of tourists — we must now go beyond this and focus on quality, profitability, innovation, and sustainability, as well as social inclusion and territorial cohesion.*

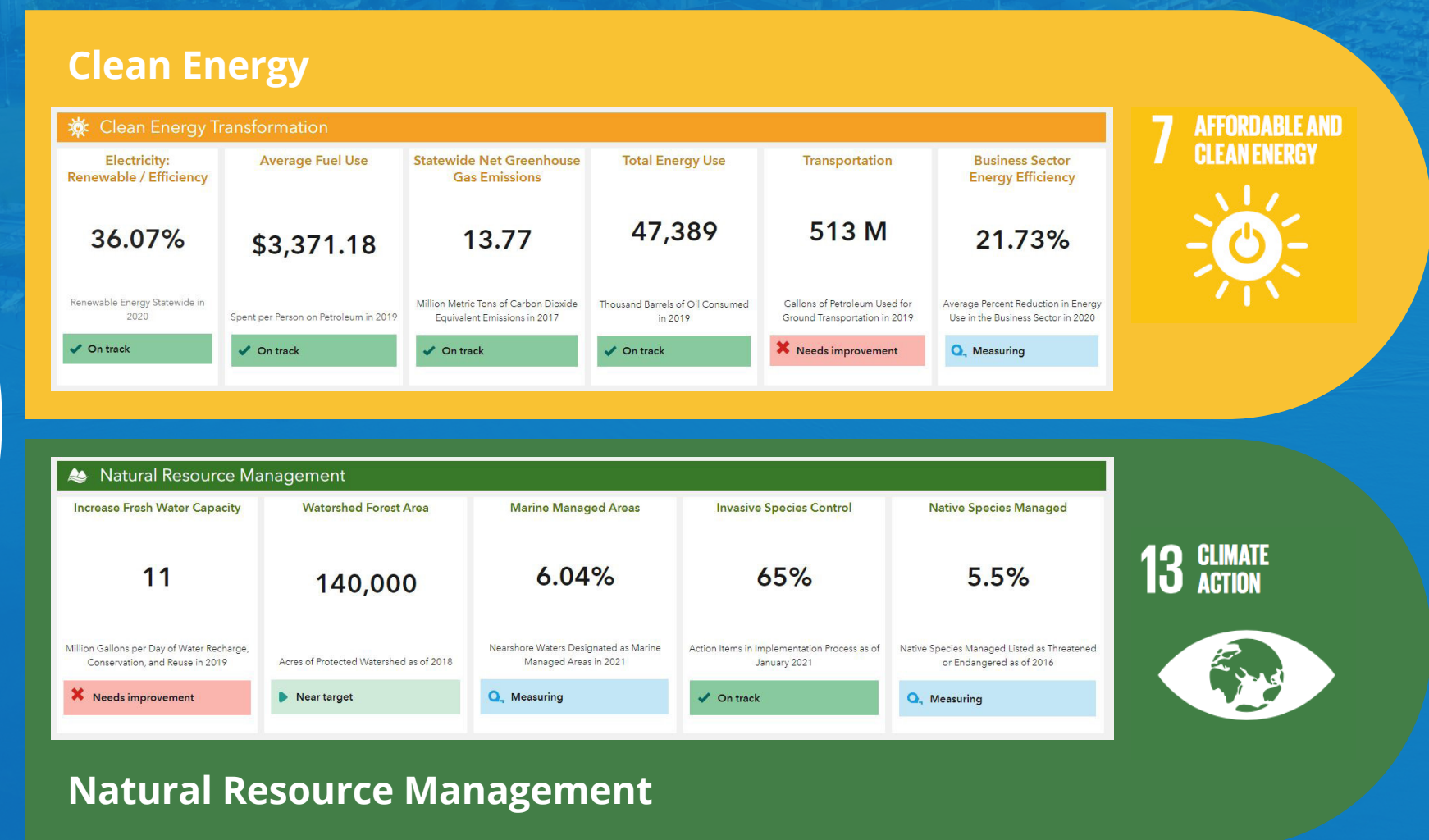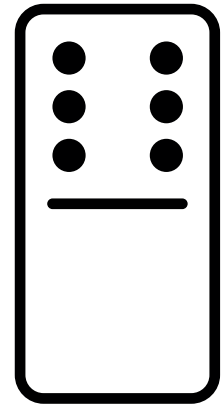**Reyes Maroto, Spanish Tourism Minister**

Aloha+ Challenge Hawaii

The Aloha+ Challenge in Hawaii has created a dashboard for the island against six of the UN's **Strategic Development Goals** using locally defined indicators. Ahead of its time, it was launched in 2014 and is part of the Hawaii Green Growth Local 2030 Hub. It offers clear and transparent metrics on the efforts made by both the public and private sector to achieve SDGs. The Aloha+ Challenge is a shared statewide leadership commitment to build a more secure, sustainable, and resilient future for Hawaii by achieving six sustainability targets by 2030. Several islands have limited data available to measure the impact and demonstrate the value of their projects and programs — Hawaii is recognized by many as a leader in this space.

You can see Hawaii's SDG dashboard here and explore the locally defined metrics and targets for each SDG.

SDG Aloha+ Dashboard and Targets

Clean Energy

Clean Energy Transformation

Electricity: Renewable / Efficiency	Average Fuel Use	Statewide Net Greenhouse Gas Emissions	Total Energy Use	Transportation	Business Sector Energy Efficiency
36.07%	$3,371.18	13.77	47,389	513 M	21.73%
Renewable Energy Statewide in 2020	Spent per Person on Petroleum in 2019	Million Metric Tons of Carbon Dioxide Equivalent Emissions in 2017	Thousand Barrels of Oil Consumed in 2019	Gallons of Petroleum Used for Ground Transportation in 2019	Average Percent Reduction in Energy Use in the Business Sector in 2020
✔ On track	✔ On track	✔ On track	✔ On track	✘ Needs improvement	🔍 Measuring

7 AFFORDABLE AND CLEAN ENERGY

Natural Resource Management

Natural Resource Management

Increase Fresh Water Capacity	Watershed Forest Area	Marine Managed Areas	Invasive Species Control	Native Species Managed
11	140,000	6.04%	65%	5.5%
Million Gallons per Day of Water Recharge, Conservation, and Reuse in 2019	Acres of Protected Watershed as of 2018	Nearshore Waters Designated as Marine Managed Areas in 2021	Action Items in Implementation Process as of January 2021	Native Species Managed Listed as Threatened or Endangered as of 2016
✘ Needs improvement	▲ Near target	🔍 Measuring	✔ On track	🔍 Measuring

13 CLIMATE ACTION

Natural Resource Management

FUNDING

Connect Smart-Island Projects to Green and Digital Transformation to Improve Chances for Funding

There are several sources of funding available to Europe's island communities. Increasingly, these funding streams are dedicated to **green** and **digital** transformation projects. There is a particular focus on sustainable tourism, the green energy sector, and the circular economy.

Funding Team
Mobilize a team dedicated to applying for national and/or regional funds. If you don't have sufficient capacity, identify knowledgeable partners. Many academic institutions have experience in funding application processes.

Measuring Impact
Invest time and resources in measuring impact. It is virtually impossible to justify further investment in a program unless you can prove the benefits. This is one of the main barriers for projects not progressing beyond pilots.

Awards and Publicity
Get recognition for your innovative projects. This will help to build your business case for future projects. Consider applying for awards such as the Island Innovation Awards or the Greening Island Awards.

Partnership
Partnering with islands for project proposals can give you a stronger business case and help create an economy of scale. Also, work closely with the private sector. It has the skills, technology, and funding, and out of enlightened self-interest, it will help.

> *There is funding available for island innovation. Islands that are successfully leveraging this have shifted their mindset from being a recipient to identifying investment opportunities. The challenge is also having the right skills and relationships to access funding. Timing is critical.*
>
> *Kate Brown, Executive Director, Global Island Partnership*

Of the **€723.8 billion** available through the **NextGenEU Recovery and Resilience Facility, 20%** must be spent on digital initiatives and **37%** on climate initiatives. The majority of funds are set to be committed by the end of 2022.

Under the REACT-EU, the Balearic Islands are to receive **€300 million**. They plan to focus on education, health, social services, technological innovation, clean energy, tourism, and transport, and leverage a significant amount of private investment.

FUNDING SOURCES

Main EU Funding Sources

STRUCTURAL FUNDS	European Regional Development Fund The Cohesion Fund European Social Fund+
INVESTMENT FUNDS	European Maritime, Fisheries and Aquaculture Fund European Agricultural Fund for Rural Development
RECOVERY FUNDS	NextGenEU (Centrepiece: Recovery and Resilience Facility)

### Examples of EU-Funded Island Initiatives
Clean Energy for EU Islands Secretariat

NESOI — New Energy Solutions Optimized for Islands (Horizon 2020 Project)

Islands of Innovation (INTERREG Project)

Examples of Funding Sources Available for Other European Islands
Commonwealth Funds such as the Commonwealth Climate Finance Access Hub

UK Shared Prosperity Fund

# SIX KEY TAKEAWAYS TO BUILD YOUR SMART ISLAND STRATEGY
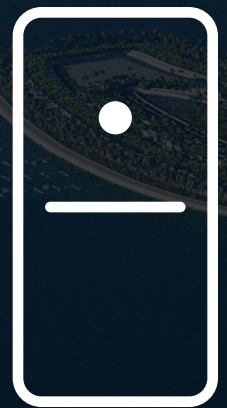
Leadership, Vision, and User Focus

Appoint a **dedicated leader** not affected by administrative changes, ideally within an arm's length special purpose delivery vehicle. Build a **multiskilled and diverse** delivery team with expertise across behavioral science, tech, data, design, community, business, and measuring impact.
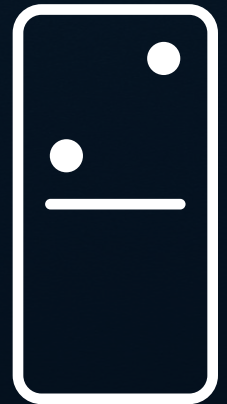
Organization and Governance

Encourage ownership through the stakeholder group **to benchmark existing resources and skills**. The resulting gap analysis will inform the required investment sequence.
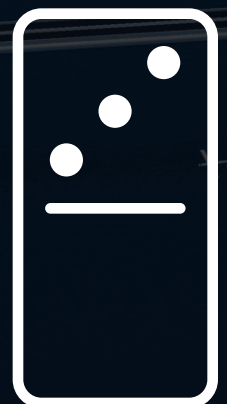
Skills and Technological Foundations

Having defined the island challenges and outcomes, focus on the technology and skills required to achieve the **strategic vision**.
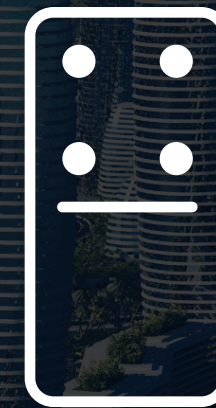
Partner Ecosystem

Build close links and **leverage the partner ecosystem**. This can be IFIs such as the EC, development agencies, academia, NGOs, and local companies.
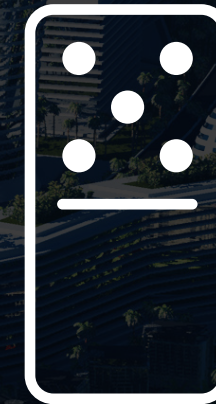
Measuring Impact

Getting investment requires the ability to **measure impact**. Having defined the required outcomes, work back through what people will have to do differently supported by what technology and what success will look like measured by what metrics.

Funding

Money is usually perceived as a barrier. However, the funding is there; the barrier is knowing where it is, and the skills required to access it. Islands need to develop **the ability to identify funding opportunities and the skills to bid for them**. Work closely with the private sector. It has the skills, technology, and access to funding.

MESSAGE FROM THE SPONSOR

Solving challenges and innovating on behalf of our customers is a top priority at Amazon Web Services (AWS). We think big together with our customers and at the same time we help them start small, focusing on incremental steps and tangible outcomes. Technology is our tool and customers our compass.

At AWS, we created the Smart Territory Framework (STF) to equip customers and members of the AWS Partner Network with a set of tools and standardized modules to build and operate smart solutions, leveraging the FIWARE open-source standards. We are also launching an AWS Smart City Competency to validate and provide the best-in-class partner recommendations to our customers, all the while empowering partners to develop and enhance their solutions on AWS.

Building on these initiatives, 'Creating a Smart and Sustainable Island Strategy' aspires to enable different stakeholders from both public and private sectors to align under a shared vision, transform this vision into strategy, and accelerate their path to results in an effective and sustainable manner. This process leverages the interoperable technologies from STF and the Smart City Partner Community to deliver a strong value proposition to our customers who work tirelessly to build sustainable islands across the world.

Local government customers across the world are increasingly looking to technology solutions to address challenges such as inclusive governance, data-driven spatial planning, and sustainable infrastructure development. These 'smart solutions' are replicable across all territories, be it cities, municipalities or islands – and, with the support from members of AWS Partner Network, can be delivered at scale and serve the mission of improving the quality of life of citizens.

If you want to know more about the AWS value proposition or discuss your Smart Territory project with our experts, contact us at **smart-cities@amazon.com**. If you are a member of the AWS Partner Network, stay tuned for the release of our upcoming Smart City Competency.

About IDC

International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications, and consumer technology markets. IDC helps IT professionals, business executives, and the investment community make fact-based decisions on technology purchases and business strategy. More than 1,100 IDC analysts provide global, regional, and local expertise on technology and industry opportunities and trends in over 110 countries worldwide. For 50 years, IDC has provided strategic insights to help our clients achieve their key business objectives. IDC is a subsidiary of IDG, the world's leading technology media, research, and events company.

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