



Global Infrastructure Hub

InfraTech Stock Take of Use Cases

9 June 2020

A G20 INITIATIVE



InfraTech Stock Take of Use Cases - Objectives

- This presentation summarizes the Reference Note for the Stock Take of Use Cases
- It supports the InfraTech Agenda by identifying InfraTech use cases in four quality infrastructure sectors (water, waste, energy and transport)
- It includes use cases across all major regions (as shown in the image below) and includes examples submitted by IWG and D20 LTIC members
- The Stock Take supports each **Element of the InfraTech Agenda** and it also identifies four key opportunities for InfraTech, which are:
 - Addressing the **barriers** to technology adoption
 - Engaging with the **private sector**
 - Supporting the advancement of **QII principles**
 - Supporting government's response to **COVID-19**
- The library is aligned with comments received from IWG members and includes use cases which illustrates various applications as shown on the next slide.



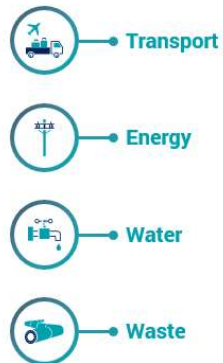
Breakdown of case studies by geography

Coverage of the use case library

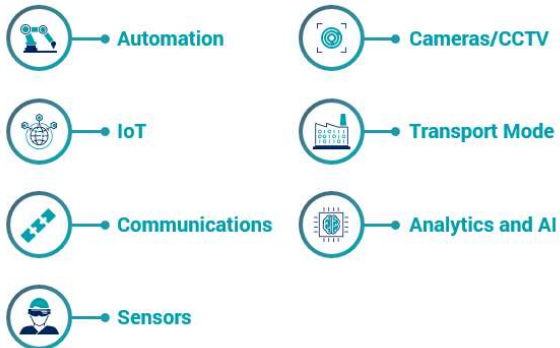
By stage of lifecycle



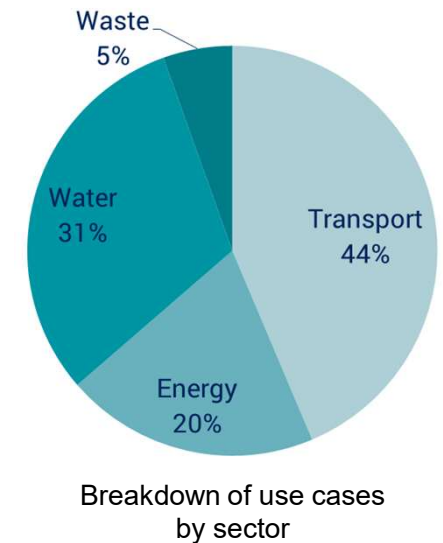
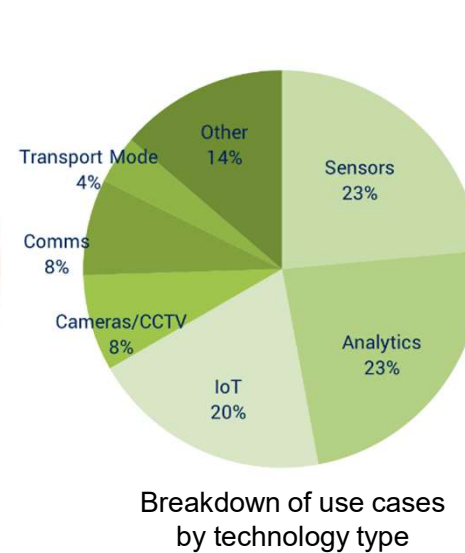
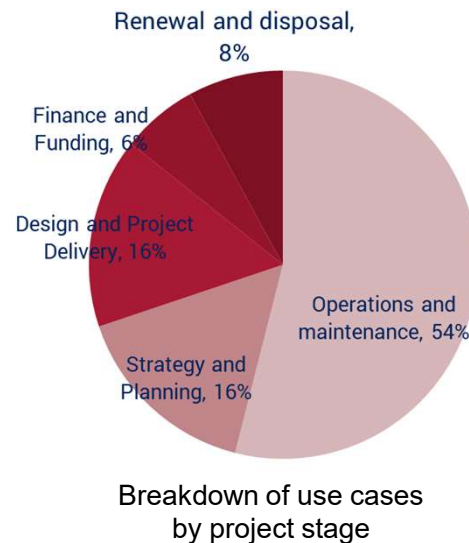
By sector



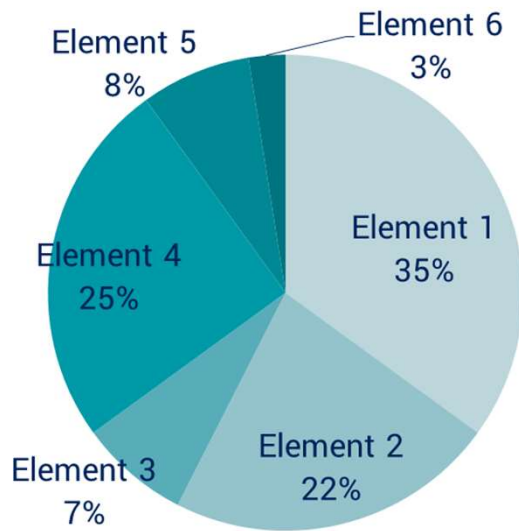
By technology type



- GIH worked with the G20, D20 LTIC and World Bank to cover a broad scope of use cases
- The Stock Take provides 40 use cases (and 100+ specific case studies) of InfraTech across geographies (as shown previously), technology types, project stages and quality infrastructure sectors.
- These use cases include high and low-cost options and applications across both developed and developing countries to ensure that it is relevant across all national circumstances.



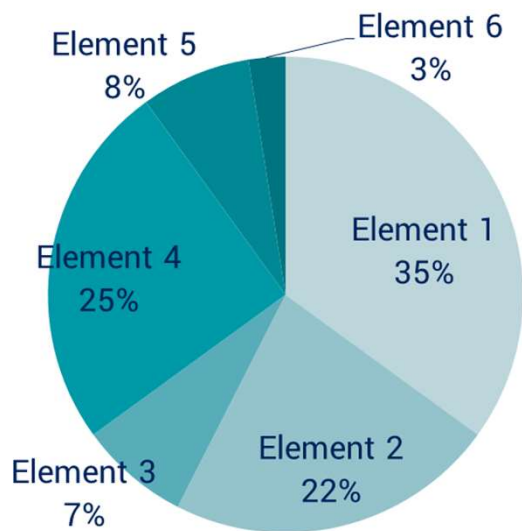
The Stock Take supports each 'Element' of the InfraTech Agenda



Breakdown of use cases by InfraTech Element

- The chart adjacent shows the breakdown of uses cases by how they relate to the Agenda 'Elements'
- To reiterate, the various 'Elements' are:
 - **Element 1:** Leverage InfraTech to enhance economic efficiencies and mobilize private sector investment to promote fiscal and debt sustainability
 - **Element 2:** Promote technologies that foster inclusivity, sustainability, resilience and sound governance
 - **Element 3:** Accelerate innovation and economic dynamism to support economic recovery and growth
 - **Element 4:** Foster a robust in-country data ecosystem to improve resilience and better inform infrastructure planning, operation, maintenance, and investment decisions
 - **Element 5:** Develop agile and flexible policy tools that promote potential growth, productivity and innovation while mitigating risks
 - **Element 6:** Promote international cooperation in R&D and knowledge sharing

InfraTech 'Elements' – examples of use cases



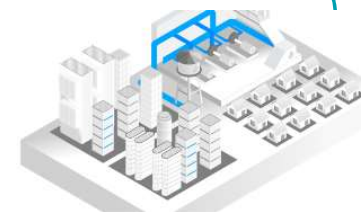
Breakdown of use cases by InfraTech Element

Element 1 example – Enhancing economic efficiencies

Use case – Intelligent Process Optimization for Water Treatment

Case study – Emagin HARVI in Canada

- Operational data to deliver automated, real-time pump schedule
- Minimize the cost of operations while guaranteeing compliance
- 21% OPEX savings; corresponds to a payback period of 3 months.



Element 2 example – Fostering inclusivity, sustainability, resilience and governance

Use case – Last Mile Infrastructure for Water Provision in Developing Countries

Case study – UNTAPPED in Kenya

- PoC in a coastal town in Kenya
- 6,500 PAYG Smart meters on an 18-month capital lease
- Brought clean and safe water to a remote coastal village
- MAWASCO recovered billing arrears and covered their lease payments



Element 5 example – Promoting growth, productivity and innovation while mitigating cybersecurity risks

Use case – Digitizing Water Access Data for Regulatory Use

Case study – NSW Dept. of Planning, Industry & Environment in Australia

- Digital metering of 8000 water access points
- Enable the regulator to enforce legislation around water access
- Tech specifications in legislation; actively promoting an open market
- Designing-in cybersecurity – encryption, VPNs, data protocols

Manufacturer	Status	Last updated
Aquasense	Devices undergoing testing	18 March 2020
Camelot Scientific, Australia	Devices undergoing testing	21 March 2020
max	Devices undergoing testing	21 March 2020
max	Devices undergoing testing	21 March 2020
myQuant Solutions	Devices undergoing testing	18 March 2020
Trayton	Devices undergoing testing	18 March 2020

Supporting government's response to COVID-19

- InfraTech in pandemic response ensures the **continued operations of critical networks**
- Utilities, transport and telecommunications are **resilient to future pandemics** and continue to operate
- InfraTech can be applied across three phases of a pandemic, including:

Alerting Phase

- Early identification of unusual events and outbreaks.
- Combining sensors with AI to detect 'hotspots' for potential outbreaks



AI for Disease Outbreak and Pandemics:

- AI + temperature sensors to identify 'hotspots'
- Case study of **IThermo in Singapore**
- IHiS partnered with local startup
- Gauge infection risk of an entire crowd within one minute
- No need for personal contact

Management Phase

- Uphold pandemic management tactics and policies
- Enabling isolation and social distancing.



Predictive Maintenance of Assets:

- Sensors, data and AI to prioritize and give early warnings
- Unnecessary site visits eliminated; maintain good levels of service
- Case study of **Data61 in Australia**
- Pipe failure prediction based on data
- Reduce maintenance and renewal costs by several million dollars
- Minimize service disruption

Recovery Phase

- Building resilience to future pandemics
- Automate and optimize the operation of assets



Intelligent Process Optimization for Water Treatment Use Case

- AI driven analytics to automatically optimize water treatment
- Unnecessary site visits eliminated
- Case study of **Createch360 in Italy**
- 19% reduction on energy consumption
- Payback period of 1-2 years

InfraTech to engage the private sector

- A draft G20/OECD report released in April 2020 identified that technology can encourage private investment in infra
- InfraTech can improve priority setting, optimize the performance of construction and optimize O&M activities



Automatic Pre-Fabrication of Stainless Steel Pipelines

- USD \$70 billion spent on new pipes; USD \$118 billion on construction and fabrication of water infra globally
- Opportunity to reduce costs and project risk through pre-fabrication from automated welding
- Case study on the **K-TIG technology in Argentina**
- Transformed economics of the project by completing fabrication in 162 days instead of the original 720 days



InfraTech to support the advancement of QII principles

- Tremendous opportunity to facilitate the implementation of QII Principles
- Enabling cost-effective upgrades, extending asset life and deferring costly asset maintenance and renewals



Low Greenhouse Gas Emission Wastewater Treatment Use Case

- Wastewater treatment is a significant emitter of methane (CH₄) and nitrous oxide (N₂O)
- Case study on **Cobalt Water in Netherlands**
- AI and machine learning to model N₂O risk and identify emission mitigation strategies
- 40% and 70% reductions in overall greenhouse gas emissions were achieved



Conclusions and Next Steps

- The adoption of InfraTech will not happen immediately. It will require the **continued commitment** of governments, the private sector and the international community.
- The InfraTech use case library is a **living resource**, and the GI Hub is committed to the **ongoing collection and dissemination** of InfraTech use cases.
- The GI Hub will produce an **interactive, online tool** that will be publicly available and hosted on the GI Hub's website.
- The use case library sparks discussion **around use case prioritization** and begins the journey towards **technology trials and full-scale adoption**.
- The GI Hub will facilitate **continued collaboration** between countries, MDBs, private investors and industry to **share knowledge** and maximizing the positive impacts of InfraTech investment according to country conditions.

We welcome all comments on the InfraTech Stock Take! We also welcome submissions of compelling use cases and case studies.

- For any questions or comments, please contact Jack.Handford@gihub.org copying Katharina.Surikow@gihub.org.