

TF7: INFRASTRUCTURE INVESTMENT AND FINANCING

POLICY AREAS:

- Exploiting technological advances for infrastructure development
- Strengthening infrastructure governance: openness, transparency and inclusion of local communities
- New initiatives and mechanisms to support digital infrastructures
- Integrating environmental criteria into infrastructure investment

POLICY BRIEF TITLE:

INFRASTRUCTURE 4.0 – VALUE CHAIN INTEGRATION THROUGH FEDERATED DIGITAL PLATFORMS

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CHALLENGE (100-200 WORDS)

21st century infrastructure needs to respond to changing demographics, become climate neutral and resilient, economically affordable, while remaining a driver for development and shared prosperity.

- Infrastructure is a priority for the G20 and has led to the establishment of the Global Infrastructure Hub, the Global Infrastructure Connectivity Alliance, G20 Principles for Quality Infrastructure Investment, and the G20 InfraTech agenda. The uptake and large-scale implementation of recommendations of these initiatives by G20 member states can still be improved.
- The infrastructure sector remains one of the least innovative and digitalized, plagued by delays, cost overruns, and benefit shortfalls. Construction productivity has actually declined in some markets since the 1990s.
- The root cause is the existing fragmentation and lack of cooperation within the infrastructure value chain. Sequential (waterfall) planning and resource-efficiency (within silos) are still common practice, compared to flow-efficiency and agility (across the value chain), preventing a more impactful realization of broader goals.
- The G20's focus on investment finance needs to be complemented by an engineering design and delivery focus.

SOLUTION (200 WORDS)

To overcome the shortcomings and break through existing inertia, an integration of the value chain is needed. This could be achieved through open and federated digital platforms applied to (trans)national infrastructure programs to:

- a) reduce risks, increase return and investment security;

- b) allow full-lifecycle participation of private and public stakeholders in the planning and innovation process;
- c) increase trust, provide transparency, reduce complexity, and support secure data sharing;
- d) accelerate digitalization of the infrastructure sector by following policies, standards, protocols and utilizing technologies like cyber-physical systems, cloud/edge computing, IoT, and AI;
- e) introduce impact metrics towards a sustainability total cost of ownership model that accelerates and dictates decarbonisation, circular material flows and environmental/commons protection;
- f) enable collaborative and smart contracting; monitor and control of the value creation process using distributed ledger technology; as well as
- g) enable international data flows; SME inclusion to avoid further concentration; better understand value chain risks/opportunities and leverage innovation.

The G20 could reach consensus on a shared vision for socially and environmentally sustainable infrastructure and become the forerunner of “Infrastructure 4.0” by using the existing G20 hubs and alliances to promote policies, standards, and technologies needed to blueprint and implement open and federated digital platforms.

RELEVANCE TO THE G20 (30-100 WORDS)

The policy brief contributes to the T20 “*Task Force 7: Infrastructure Investment and Financing*” and the policy areas “*digital infrastructure*”, “*infrastructure governance*”, and “*technological advances*” and builds upon the “G20 Principles for Quality Infrastructure Investment” by enhancing the “G20 Infratech Agenda.” The policy brief also contributes to the G20 Infrastructure Working Group (policy areas preparation and management) and supports the UN SDGs 9, 11, 13, and 17. This policy brief is based on research and numerous expert interviews carried out since July 2020. An international workshop to finalize the policy brief will be held in Munich on 2 April 2021.

ABSTRACT (300 WORDS)

21st century infrastructure needs to respond to changing demographics, become climate neutral and resilient, economically affordable, while remaining a driver for development and shared prosperity. Infrastructure is a priority for the G20 and has led to the establishment of the Global Infrastructure Hub, the Global Infrastructure Connectivity Alliance, G20 Principles for Quality Infrastructure Investment, and the G20 InfraTech agenda. However, the infrastructure sector remains one of the least innovative and digitalized, plagued by delays, cost overruns, and benefit shortfalls. The root cause is the existing fragmentation and lack of cooperation within the infrastructure value chain. Sequential (waterfall) planning and resource-efficiency (within silos) are still common practice, compared to flow-efficiency and agility (across the value chain), preventing a more impactful realization of broader goals.

To overcome the shortcomings and lack of progress, an integration of the value chain is needed. This could be achieved through the creation of open and federated digital platforms that are applied to (trans)national infrastructure programs. Such platforms enable full-lifecycle participation and responsible infrastructure governance thereby reducing risks and increasing return and investment security. The application of new technologies and federated data spaces would support data sharing within and across national boundaries, improve participation of smaller firms, and foster innovation.

The G20 could reach consensus on a shared vision for socially and environmentally sustainable infrastructure and become the forerunner of Infrastructure 4.0 by using the existing hubs and alliances to promote policies, standards, and technologies needed to blueprint and implement open and federated digital platforms.

The policy brief contributes to the T20 “*Task Force 7: Infrastructure Investment and Financing*” and the areas “*digital infrastructure*”, “*infrastructure governance*”, and “*technological advances*.” This policy brief also builds upon the “G20 Principles for Quality Infrastructure Investment” and the “G20 Infratech Agenda” and would contribute to the G20 Infrastructure Working Group.