Our Positions on Sustainable Digital Infrastructure

The SDIA have assessed Digital Infrastructure in Europe and derived a number of fundamental positions, beliefs and principles from which we derive our view on the future of Sustainable Digital Infrastructure. It’s our goal to ensure the development of a vibrant European digital economy, without consuming unsustainable levels of resources.

Our definition of Digital Infrastructure consists of Data Centers, Fiber & Telecommunication Networks, Power Generation, IT Hard- & Software.

Our Core Beliefs

- Digital technologies will give the human population tools to address, through innovation, some of the world's major challenges.

- The digital economy will create economic growth through the exploitation of knowledge & value creation rather than the exploitation of natural resources.

- Digital Infrastructure will grow exponentially throughout the Digital Era - also considered the 4th Industrial Revolution - as technology services and the data they produce embed themselves in our everyday lives.

- Digital Infrastructure, particularly data centers, consume large amounts of resources, and are the fastest growing electricity consumer on the planet, compared to any other single industry. With today's methods of provisioning Digital Infrastructure we will see demand for resources and energy increase in-line with the growth of the digital ecosystem. We have the opportunity to make Digital Infrastructure sustainable at scale.

- Sustainability does not always come at a cost, and the SDIA is convinced that we can minimize environmental and social costs without sacrificing economic growth. There is a business case for sustainability - and it is an European opportunity.

- Many technological innovations will be needed to enable sustainable Digital Infrastructure, which should be driven by all actors across the value chain.

- Digital Infrastructure must be affordable and democratically accessible in order for Digital services to thrive.
The Need for a strong Digital Sector

Countries need energetic digital service sectors. They are drivers of social and economic development, job creators, talent magnets and the exports of the future.

- Robust digital service sectors depend on a complex ecosystem that includes adequate infrastructure and an investment-friendly business environment.

- Digital services should be designed with resource consumption in mind. Simplifying and streamlining software will minimize compute requirements in data centers.

- Digital services should be designed to become delay tolerant wherever possible, allowing data centers to shift workload in time. This delay tolerance is a form of energy flexibility vital for the integration of variable renewable energy.

- Digital Services should be designed to become location tolerant wherever possible, allowing data centers to shift workloads across multiple locations. This location tolerance is a form of energy flexibility particularly useful in removing energy grid congestion, optimising energy costs for data center providers and improving service availability for customers.

- Data center Virtualization & Orchestration technologies should consider and optimize for energy consumption, and should consider the efficiency of the underlying infrastructure.

- Both software and hardware have a role in making data centers more sustainable. We cannot separate one from the other, especially with respect to efficiency. Hence both must be actively considered when working on the overall efficiency.
A Vision for Europe's Role in the Digital Economy: Crafting a Digital Renaissance

- Europe is lacking a strong digital ecosystem and is slower than many other countries in the digitalization of its industrial & service sectors.

- There should be a federated consortia of European data center operators in order to ensure a diversity of supply.

- A true single digital market, in which data and services can flow across borders, is required to build a robust digital service sector in Europe.

- Effectively delivering sustainable Digital Infrastructure and realizing the promise of the digital economy rests on the following pillars:
  1. It must be affordable.
  2. It must be sustainable.
  3. It must be inclusive.
  4. It must be secure and compliant.
  5. It must to be global, yet European
  6. It must be federated

A Regulatory Approach that enables the Digital Renaissance

- Today's critical issues concerning Digital Infrastructure span a much more complex, interconnected value chain; policies must take into account the impact on investment and innovation across multiple industries.

- Governments play a key role in catalysing digital development by creating the right environment. Regulations should be accountable, transparent and fair. Policy-makers should be aware of regulatory gaming.

- Government should focus on modernization of policies and regulations to encourage investment and innovation throughout the Digital ecosystem.

Funding Mechanisms that could enable long-term growth of Europe's Digital Sector

- Europe's digital health requires attention; without Digital Infrastructure investment, it is difficult to see the EU capitalizing fully on the benefits of the Digital economy.

- There should be more commitment from the EU as well as national governments for actions that promote the long-term growth of the digital economy.
– Public-private partnerships can encourage efficient and expedient infrastructure deployment.

– The development of local digital service markets can be big steps towards addressing local problems.

– Bridging the digital divide may require non-traditional, innovative approaches, especially in funding and market access mechanisms.
Essential Components of Sustainable Digital Infrastructure

Unless changes are made, inefficiencies in allocation, utilization and consumption will only get worse as demand for digital services increases.

1. Recovering Heat

   - Residual heat from data centers should not be wasted, and should be recycled wherever possible.
   
   - Putting a value on the recovered heat is the way forward to incentivise recycling of heat. This valorization should be supported by the whole value chain, for both moral, ecological and economic reasons and this may require regulatory incentives.
   
   - Heat capture and recycling requires technical standards for delivery. A voluntary standards body of like-minded vendors, suppliers and end users, could develop and disseminate standards in a relatively short period of time.
   
   - The SDIA's Combined Heat and Compute plants (CHC) reference design is the idealised solution for recycling waste heat from data centers into the heat grid as well as integrating data centers with renewable energy.

2. Role of Renewable Energy

   - Digital Infrastructure should run on 100% renewable energy, in a manner that supports the direct expansion of the renewable energy sector.
   
   - Co-Locating Digital Infrastructure with renewable resources enables direct interconnects between data centers and renewable generation and should be considered for all newly built Digital Infrastructure projects.
   
   - Digital Infrastructure should play an active role in supporting the integration of more renewable energy into the energy system.

3. IT Hardware Design

   - Energy Efficient hardware is a basic necessity towards making computation more efficient, and this includes improving the efficiency and utilization of hardware.
   
   - Data Centers should engage in strategies & schemes to maximize utilization rate wherever possible.
Actors across the value-chain should collaborate to develop a reliable and transparent metric or set of metrics in order to quantify the effective efficiency of data centers and Digital Infrastructure as a whole.

4. Transparent Supply Chains

- Sourcing of data center hardware & components should be environmentally and socially responsible, and resource consumption should be minimised as much as possible.

- The resource consumption of components used within Digital Infrastructure should be made transparent across the supply chain and to end-users.

- Life Cycle of hardware & components should be considered and extended as long as possible. Life Cycle Analysis (LCA) should form best practises, particularly with respect to the release of aerosols.

- Recycling and refurbishing of end-of-life hardware & components must become more widespread. Recycling and refurbishing pathways should be established and should form part of the LCA, as per above.

- Sourcing, recycling and transparency through LCA’s will lead to more awareness and empowerment for vendors and suppliers.

5. Maximum Utilization

- A marketplace for compute is a desirable model to allocate computing resources in an efficient manner. Markets are typically (though not exclusively) the best model to allocate resources.

- A marketplace for computing resources should prioritize sustainable sources of compute, e.g. data centers that valorize heat, utilize renewable energy and implement extended life-cycles for hardware.

- A marketplace should take into account the availability or demand of the resources, e.g. power production in a specific area or heat demand.

6. Embracing Synergies

- Data Centers should implement means to support flexible power consumption. Doing so should be of value to data center operators, the energy grid and end customers.

- Putting a value on bi-directional energy flexibility - the use of data centers as flexible energy assets in the energy grid - should be simplified.
- Local flexibility markets could be a good first step towards valorizing and activating flexibility from data centers.

- Technical standards and best practises must be created to facilitate data centers activating their energy flexibility without compromising their workload availability.

- Treating data centers as energy assets is a cost efficient, resource efficient approach to provisioning Digital Infrastructure.