Carbon-aware Networking:
Key Challenges & Next Steps

- **Reduce our environmental impact**, e.g., 50% by 2030, 10%/year, etc.
- **Augment traditional QoS metrics**
  - Expose not only energy metrics, but also carbon and environmental metrics
  - Cannot "energy efficiency" our way to net zero GHG emissions by 2050
- **Deliver carbon-intelligent telemetry** → pain-point analysis
  - Enable ***real-time*** observability & quantification - platforms, components, threads, 2nd'ry effects
  - Monitor electricity consumed and carbon-intensity, leveraging in-network telemetry
  - Build shared tools – for ***accurate*** measurement, modeling, prediction (rescue traceroute?)
- **Develop carbon-aware routing, transport, traffic engineering techniques**
  - Accelerate deployment, rigorous testing/certification, attestation, scalability (inter- vs. intra-AS)
- **Collaborate** - *"Covid, a dry run for Climate Change"*
  - ***Collaborate across Comms standards orgs*** - to analyze gaps, best practices, shared terminology
  - ***Understand Socio-technical implications*** - to affect the right kind of change, policies, adoption
  - ***Delve into the who/what/why of the Electric Grid*** - its business models, edge-ification, shifting ownership, how to influence its re-architecture