Energy Resilience for European Municipalities

30.07.2026 I A Presentation for PeerConnect

Content

- Energy Resilience: Concepts, Definitions and International Approaches – our study for BDEW
- Energy Resilience for Municipalities – some concrete guidance



1.
Energy Resilience: Concepts, Definitions and International Approaches



Understanding Energy Resilience

Resilience in the energy policy discourse

Two levels of action

Operational level

- Obligations of individual operators
- Physical Asset Protection
- IT & Cyber Security
- Incident management
- Reporting obligations
- Implementation work remains, but regulatory framework is in place (especially KRITIS umbrella law and NIS 2 implementation law)

Strategic planning level

- Systematic integration of resilience criteria into the medium and long-term planning instruments of energy infrastructure
- Relevant planning instruments work predominantly with planning case and efficiency logic
- There is a need to catch up conceptually here

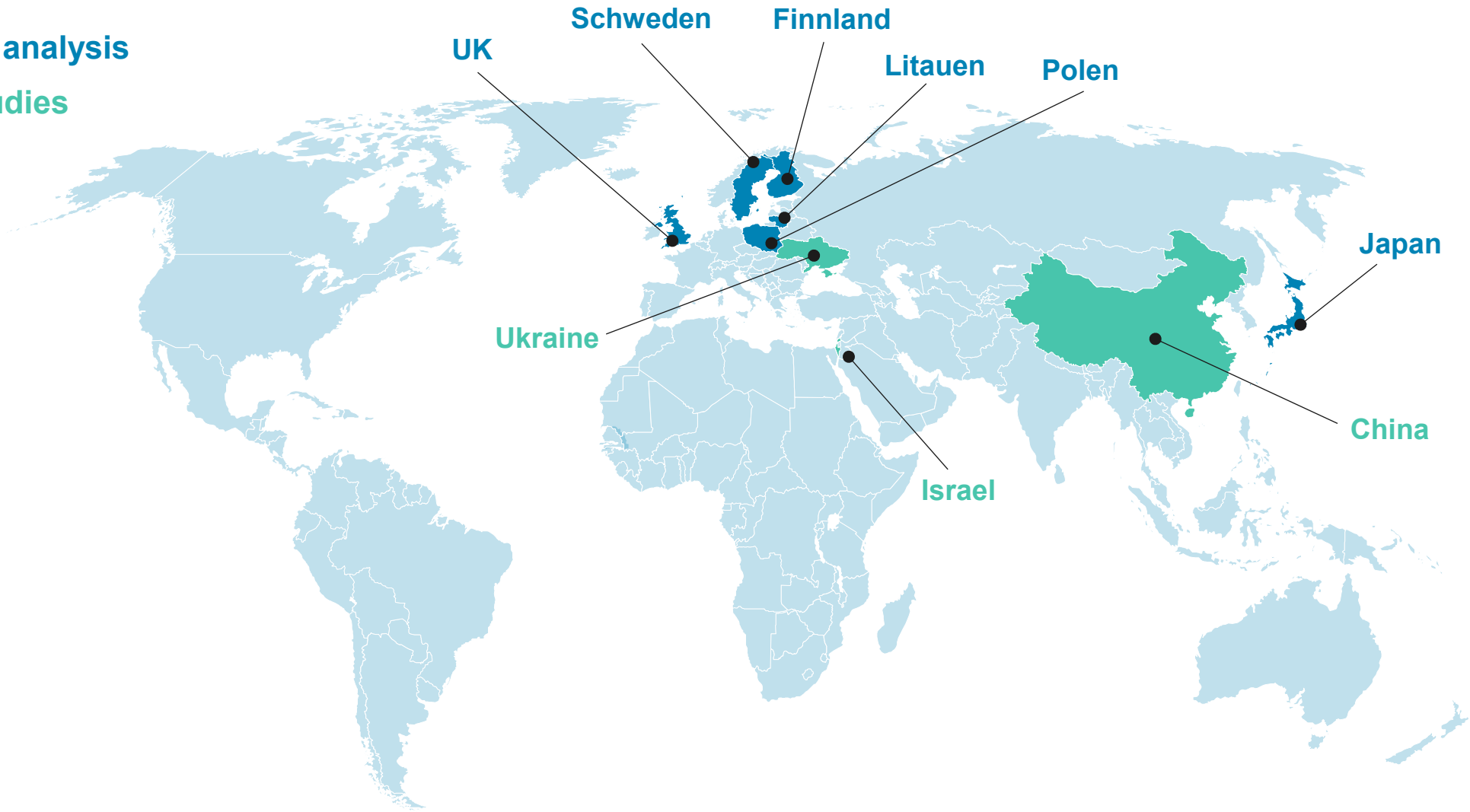
Focus of the study: strategic resilience planning (operational level is largely excluded)

HIC CONSULTING

International analysis

6 country analysis

3 case studies



HIC CONSULTING

Comparative summary of the country analysis: Seven recurring Best Practices

Institutional bundling with clear leadership

Strategic resilience strategy as a policy framework

Public-private partnership structures

Stockpiling beyond the EU minimum standard

Controlled diversification

Stress scenarios and risk architecture

Regional resilience and island operations embedded in planning

The seven best practices paint a picture of an integrated strategic resilience planning (these components are not fully available in any country, but are developed to varying degrees in different countries)

Stress scenarios and infrastructure and grid planning

Internationally, the integration of stress scenarios is a clear target image, especially in the context of grid planning.

However, the comparison countries have also not achieved complete integration of risk architecture and grid planning.

Country examples:

- **UKs** National Risk Register is the most detailed approach— 89 publicly published risks in nine thematic areas, each with a „Reasonable Worst-Case Scenario“ and annual reporting obligation for NESO and Ofgem. NESO complements this with Future Energy Scenarios with explicitly negative paths („falling behind“-Scenario).
- **Finland** operates with the "Open List" logic.
- **Japan** uses concrete real events as stress tests.

Regional resilience and island operations anchored in planning

Many countries are promoting regional structures of their energy systems to increase system resilience.

Island operation remains the technical fallback level of grid reconstruction — it is not a planning-based element of crisis prevention.

Country examples:

- **Sweden** shows the clearest example: the *elförsörjningszoner* segment the country into utility areas, *ödrift* skills are practiced operationally in several regions, and the *Styrel* system prioritizes bottom-up power supply to critical consumers.
- **Japan** combines centralized grid planning under OCCTO with local microgrids.
- **Israel** addresses resilience via solar roof obligation and differentiated feed-in tariffs.

HIC CONSULTING

Typification of scenarios and institutional anchoring

Six types of disruption as an inductive derivation from the country analyses.
The focus of the consideration is on the two main types G and A.

Climate risks (K)	Technical risks (T)	Global political risks (G)	Asset destruction (A)	Cluster or contagion risks (C)	Social or endogenous risks (S)

In the countries studied, it is also possible to find roughly **three approaches to scenario processes:**

Top-down
State sets high-level scenarios, companies execute (e.g. Lithuania and Poland)

Bottom-up
Industry plans, state only sets the framework (e.g. Finland)

Hybrid
The state sets goals, decentralised operation is institutionalised (e.g. Sweden, UK)

→ Across all approaches: technical leadership in **demarcated institutions**, updating at a **fixed cycle** and binding **integration of stress scenarios**.

Key elements of the country analysis Finland

Two-pillar model for stockpiling

- First pillar: State reserves maintained by NESA for the central fuels and energy sources (exact quantities and storage locations are subject to confidentiality)
- Second pillar: Legal stockpiling obligation for importers
- Stockpiling logic is structurally linked to import dependency

Explicit emergency power plant

- NESA reserves Finland's last coal-fired power plant (565 MW) until the end of 2026 as the only emergency reserve for war and hybrid scenarios – without the agreement it would be decommissioned

Distributed generation as a resilience dimension

- Strategic upgrading of decentralised generation via three indirectly acting mechanisms
- (1) Regulatory requirement for DSOs for maximum supply disruption stimulates local resilience solutions in practical implementation
- (2) Structurally decentralised generation architecture via district heating from predominantly local CHP generation
- (3) Prioritization and resupply system regulates the sequence of resupply after incidents

Key elements of the country analysis Sweden

Specific endurance requirement: 14 days or one week of self-care

- Strategic anchoring: concept of overall defence (military and civil defence is treated as an integrated whole)
- Target: Population should survive at least one week without state support

Island operation capability (ödrift)

- Systematic preparation of island operational capabilities
- Division of the country into regional electricity supply zones, whose generation and consumption balances are analysed with a view to emergency operation

Formulated prioritization system

- *Styrel* prioritization system ensures that in the event of a manual load cut-off, socially critical electricity consumers are given preference
- Identification and prioritization is bottom-up

Investment management via *Beredskapsåtgärder*

- Resilience investments are managed through separate, application-based crisis preparedness measures (*Beredskapsåtgärder*) at *Svenska Kraftnät*
- Distribution system operators can submit targeted applications for co-financing for resilience-enhancing investments

Conclusion & Outlook of our Analysis

Four general findings

1) Analytical separation between operational and strategic resilience levels
2) Global political disruptions and the targeted destruction of critical assets are currently hardly covered strategically
3) Fundamental problem of distinguishing between stress situations and full-blown crises
4) Greater consideration of resilience is often only made possible by political catalysts

Three key observations from the country analysis:

1) Relationship between the state and the energy industry takes place through institutionalised cooperation structures
2) There are limits to voluntariness
3) A category of resilience shares can be identified, the provision of which remains tied to the entrepreneurial level

Guiding principles for further processing

1) Additional bureaucratic burdens must be kept as low as possible
2) Sustainable financing must be ensured

Energy Resilience for Municipalities



What can be done concretely? (1/2)

It costs nothing but time…

- **Find out: How long** does each function keep working without grid supply?
  - ➢ Write it down in hours: administration and crisis staff, emergency calls, water and wastewater, one heated building, the fire station, fuel for municipal vehicles.
- Two **questions for the distribution operator**:
  - What happens to the heat network when the power goes ?
  - How long a repair really takes for the faults that are most likely ?
- The **list of critical consumers**. Care homes, dialysis, home ventilation, livestock. Usually the municipality is the only body that has it.
- **Who** talks to the network operator, who to the state authority, who to the press ? → Best agreed beforehand !
- **Contact** with the organisations that would open community help points.

What can be done concretely? (2/2)

It costs a few thousand euros…

- Generator inlets and transfer switches in the buildings you have designated
- Test under stress. Starting is rarely the problem; refuelling and staffing usually are
- Refuelling schedules arranged in writing
- Loudspeakers, printed notices and fixed noticeboards for when the phones are gone

It costs much more later than now…

- Islanding capability and a connection point as standard for new PV, batteries, CHP units and boilers.
  - ➢ Cheap in the tender, expensive as a retrofit
- Backup power sized against the endurance figure you set, not against a catalogue product
- Civil protection and energy infrastructure qualify under the federal infrastructure fund, though the rules differ by state
  - ➢ Not a municipal task
- Grid restoration, telecommunications, national reserves, the security of transmission infrastructure

Strategic guidelines (1/2)

- **Put a number on endurance.**
  Sweden works to one or two weeks, Finland caps interruptions by law at six hours in towns and thirty-six elsewhere.
  - ➢ *A clear goal might be a good number. What does your municipality strive for?*
- **Plan for reduced supply, not only for none.**
  Which functions still work on half a day of power is a very useful question.
- **Buy it in the tender.**
  The only point on this list where waiting makes it several times dearer.
- **Hang it on other planning.**
  Heat plans e.g. are mandatory, funded and already running – consider add-ons

Strategic guidelines (2/2)

- **Use meetings that already happen.**
  Concession renewals, heat planning consultations, the regular round with the network operator. Just ask additional questions.
- **Expect help to be slow, so connect closely and early.**
  Arrangements with the neighbouring municipality and the district take effect faster than anything from above.
- **Lobby for a clear foundation**
  Connection points, lists and agreements are your decisions. A national risk register, a prioritisation system reaching the local level and co-financing are not.
- **Some federal support**
  Backup power, generator connection points and resilient heating infrastructure are in principle eligible from the states-and-municipalities pillar of the 100-billion Sondervermögen, because civil protection and energy/heating infrastructure are named in the funding catalogue. But only capital investment qualifies — not the personnel, fuel and operating costs that make a measure work — and the additionality rule limits what counts as genuinely new. Check your own state's guidance and your municipality's individual budget rather than the federal figure

Your points of contact at HIC Consulting



Jakob Schlandt

Senior Manager

Head of Policy & Markets

T +49 (0)40 3910 6989-26
M j.schlandt@hic-consulting.com



Felix Landsberg

Senior Manager

Head of Energy Planning

T +49 (0)40 39 10 69 89-35
M f.landsberg@hic-consulting.com



Florian Isselmann

Consultant

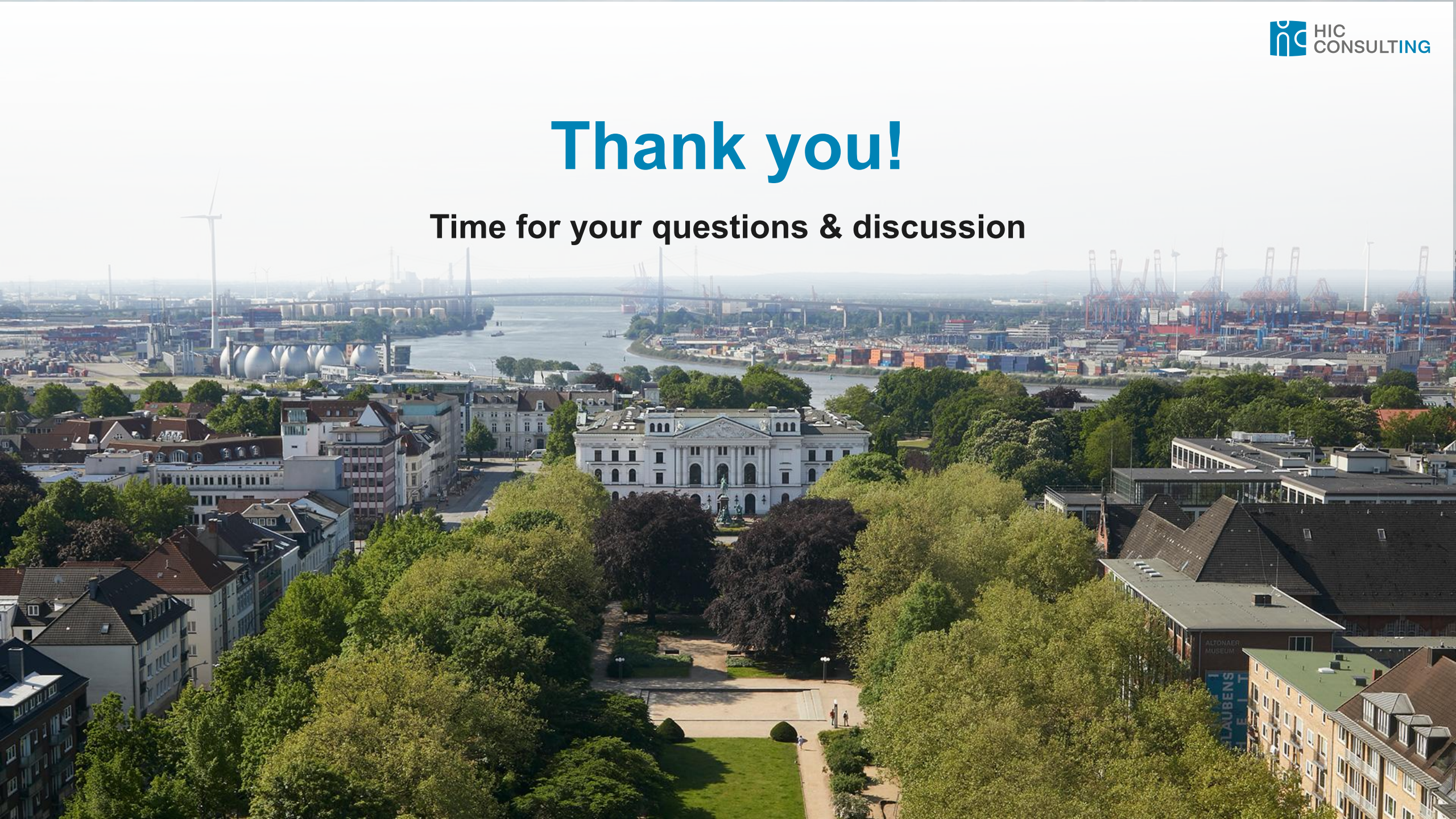
T +49 (0)40 3910 6989-40
M f.isselmann@hic-consulting.com

Up to date bleiben – mit dem HIC Newsletter

HIC CONSULTING

Thank you!

Time for your questions & discussion



Stay up to date

WEBSITE

www.hic-consulting.com
www.hamburg-institut.com

SOCIAL MEDIA

www.linkedin.com/company/hicconsulting und
https://bsky.app/profile/hamburg-institut.bsky.social

HIC-NEWSLETTER

QR-Code or
https://www.hic-consulting.com/newsletter-anmeldung

