

## Declaration of intent for KTH participating in the competence centre NBL

### Reason for participation in the centre

At KTH, we take the lead for a sustainable society. National Building Laboratory (NBL) directly embodies this commitment — advancing data-driven energy management of the built environment and climate-neutral building stocks through high-performance computing, digitalisation, and artificial intelligence. NBL's strategic collaborations span national, regional, and local public authorities, industry partners, and leading academic institutions across Sweden and beyond, making KTH the natural host for this national resource. With this application, we are allocating our best competences and our best supercomputing resources to simulate every applicable building in the nation, in order to enable better investments towards energy efficiency and a smarter energy system.

### The proposed competence centre in relation to long-term research strategy and innovation environment at your organization

NBL aligns with KTH's Vision and Overall Goals 2024–2028, President Anders Söderholm's priority of building robust and systematic research structures, and KTH's sustainability target of reducing climate impact by 60% by 2030. What is unique with NBL is that it challenges existing conceptions about urban energy system data — making each stakeholder a data owner who relies on academia for decision-support rather than passive data delivery.

The centre draws on four KTH schools and over 10 faculty spanning the Sustainability Department, Energy Technology, Computer Science and AI, Real Estate Economics, and Electric Power and Energy Systems. Its organisational home is KCSC — established by President Söderholm in November 2025 — whose colocation model at Teknikringen 14 has produced world-leading research software and provides the ideal interdisciplinary environment for NBL. Dedicated office space becomes available following building renovation in 2027. NBL also complements Dig-IT Lab and KTH Live-In Lab. Its launch on 1 January 2027 coincides with KTH's 200th anniversary — a signal of what the next generation of KTH innovation looks like.

### Description of the participation

KTH manages the centre through a Centre Director and Scientific Director, both at the School of Architecture and the Built Environment (ABE). Research is organised into four tracks: (1) Supercomputing Lab and AI Integration — a federated data platform and large-scale building stock simulations; (2) Building Simulations —, building physics, energy conservation, and life-cycle impacts; (3) Economic Valuation and Maintenance Strategy — bridging engineering performance and financial

decision-making for property portfolios; and (4) Urban Energy Systems and Grid Interaction — integrating grid engineering, district energy, geospatial modelling, and urban systems perspectives.

The centre directly trains 3 doctoral students and 2 postdoctoral researchers, co-located at Teknikringen 14 under an agile sprint-based methodology ensuring continuous interdisciplinary collaboration. In addition 10 doctoral students and 2 postdoctoral students across partner universities will create synergies as NBL Fellows - needed to reap transdisciplinary benefits from the centre. The lab being integrated at KCSC also enables new collaborations between researchers and research students at KCSC, such as the intersection between energy simulations and the world-leading research team on computational fluid dynamics.

### **Type of commitment**

KTH provides 7 MSEK per year (35 MSEK over five years) — one-seventh of the centre's total annual budget of 7 MSEK — are from central KTH funds, faculty co-financing (FoFu) from the seniors of 3 MSEK, and the remaining 25 MSEK from KCSC/PDC resources including the operation of the infrastructure surrounding the Dardel supercomputer and lab at Teknikringen 14.

NBL activates a share of this existing infrastructure as directed research capacity — making KTH's commitment both sustainable over the full five-year period, with a clear path to extension through 2036.

SISAB (Skolfastigheter i Stockholm AB) is responsible for developing and managing school buildings for the City of Stockholm, providing safe, healthy, and sustainable learning environments for children and young people.

As part of Stockholm's environmental programme 2030, SISAB has a clear mandate to contribute to the city's climate transition, including the ambition to halve its climate impact by 2030 and operate as a fossil-free organisation.

At the same time, SISAB manages a complex building portfolio with high requirements on indoor climate, ventilation, and operational reliability. Meeting these requirements while reducing energy use and climate impact requires improved, data-driven decision support for maintenance planning, energy efficiency measures, and long-term investments.

The National Building Laboratory (NBL) provides a unique opportunity to address these challenges. By combining large-scale data with high-performance simulations of real buildings, NBL enables the development of validated strategies tailored to SISAB's actual portfolio.

### **Participation in NBL supports SISAB in:**

- Prioritising energy efficiency measures and maintenance actions across the portfolio
- Ensuring high-quality indoor environments in schools while reducing energy use

- Supporting Stockholm's climate and environmental targets through evidence-based decisions
- Strengthening the use of data in planning, follow-up, and investment processes

**Description of the participation:**

SISAB will participate as an industry partner in the competence centre.

Our participation includes:

- Providing access to selected school buildings for data-driven modelling and simulation
- Sharing relevant data (e.g. energy use, building characteristics, maintenance plans) within KTH's secure research infrastructure
- Contributing expertise related to school buildings, indoor climate, and long-term portfolio management
- Participating in workshops, sprint activities, and Energy Summits
- Contributing to validation of results to ensure applicability in real operations

**Type of commitment**

- In-kind contribution: Approximately 250,000 SEK per year, primarily in the form of staff time.

**This includes time dedicated to:**

- Data provision and coordination
- Participation in meetings, workshops, and Energy Summits
- Internal work related to energy management, maintenance planning, and follow-up

This corresponds to approximately 0.1–0.15 FTE, distributed across relevant roles (e.g. energy specialists, property managers, and strategists). The in-kind contribution is aligned with SISAB's ongoing work in energy efficiency, sustainability, and portfolio management, and represents coordination of existing activities rather than additional cost.

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*Town, date*

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*Signature of authorised signatory*

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*Printed name*

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*Title*