TopNANO – new Nordic research using nanotechnology to avoid problems with ice

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TOPNANO

- Top-level nanoscale coatings and surface treatment to prevent and combat condensation of water, ice formation, ice growth and adhesion with applications in **aircraft, wind turbines and heat exchangers** for improved energy efficiency and safety
- Strong research and industrial consortium covering three very important industrial applications where ice accretion
- Duration 2010-2014 – grant from Top-level Research Initiative 15 MNOK, total project budget 30 MNOK

Sectors where YKI work on applied surface chemistry

Biotech/Medtech

Cleantech

Polymers

Materials

Chemicals

Coatings

Foods

Printing

Cleaning

Pharmaceuticals

Personal and Beauty Care

Paper and Packaging

INTERMAT –
Interfacial Materials Centre for Cleantech Applications

”All clean technologies contain surfaces that are critical elements to their efficient function”

Current projects

- **Identifying technical challenges and opportunities with interfacial materials in the cleantech sector**
- **Alternative Energy** - fuel cells, PV solar
- **Aircraft, wind turbines, heat exchangers** – anti-iceing surfaces
- **Renewable materials** - biopolymer composites
- **Super-lubrication** - low friction systems
- **Water quality** - photo catalytic reactors, pollution scavenging nanotech

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Top-level Research Initiative

Top-level Research Initiative

-A major Nordic venture for climate, energy and the environment

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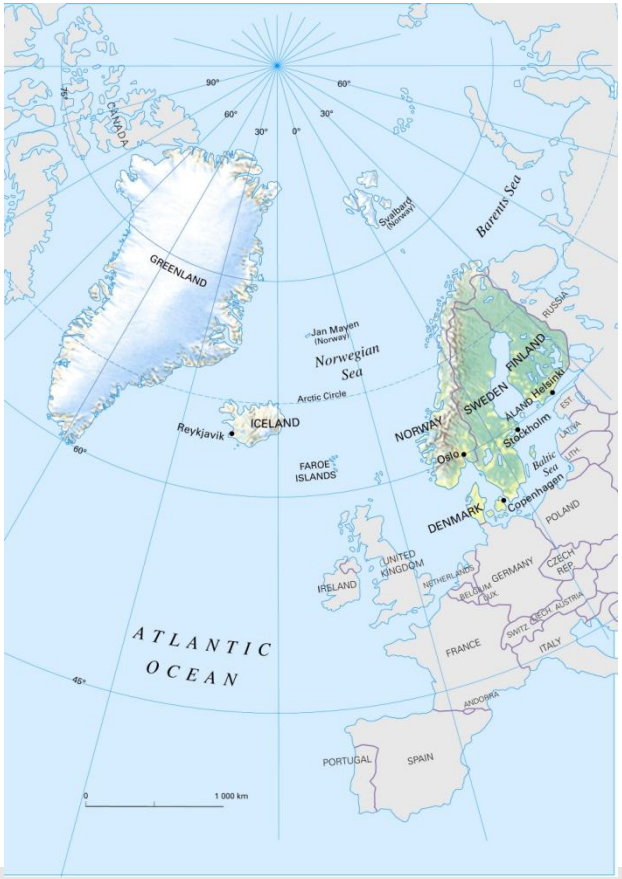
Top-level Research Initiative

The Nordic region

The Nordic countries

- Denmark
- Finland
- Iceland
- Norway
- Sweden

The Nordic countries have collaborated extensively through the Nordic Council (parliamentarians) since 1952 and the Nordic Council of Ministers since 1971



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Top-level Research Initiative

Background

The Nordic Prime Ministers stated in the Riksgränsen declaration (2008)

”The Nordic region is in a strong position to pioneer efforts to combat climate change.

A sustainable Nordic model for meeting climate challenges will demonstrate the potential for combining reduced emissions with economic growth”.

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Goals of TFI

Nordic coordinated efforts towards research and innovation on climate, energy and the environment.

Develop collaboration between research and innovation organizations and institutions in the Nordic countries.

Act as a platform for further international collaboration.

Horisontal themes:

Advanced climate modeling

Social sciences and humanities

A focus on the Arctic area

Top-level Research Initiative

- a major Nordic venture for climate, energy and the environment

The Top-level Research Initiative (TRI) is the largest joint Nordic research and innovation initiative to date. The initiative aims to involve the very best agencies and institutions in the Nordic region, and promote research and innovation of the highest level, in order to make a Nordic contribution towards solving the global climate crisis.

The Top-level Research Initiative consists of six sub-progammes. Read more about these and the Top-level Research Initiative on these pages!

Effect studies and adaptation to climate change

Interaction between climate change and the cryosphere

Energy efficiency with nanotechnology

Integration of large-scale wind power

Sustainable bio-fuels

CO2 – capture and storage

Project objectives

Described new phenomena in journals, at conferences and to general public. 2 PhD, 3 postdocs and 3 associated PhDs. PhDs started finalized through other funding. Benchmarked concepts at industry partners. Shorter field tests during three seasons. Field test of 3500 h in last season for most promising concept. LCA analyses of coatings

Technology Readiness Levels (TRLs) to ensure suitable evaluation:

TRL1 Basic principles observed and reported

TRL2 Technology concept and/or application formulated

TRL3 Analytical and experimental proof-of-concept

TRL4 Concept validation in lab environment

TRL5 As above in relevant environment

TRL6 Prototype demonstration in relevant environment

TRL7 As above in suitable environment

TRL8 Actual system completed and “qualified” through test and demonstration

TRL9 As above in successful long-term tests

TRL goals for TopNANO:

Taken one concept from Technology Readiness level (TRL) 2 to 5

Two concepts from TRL1 to 4

Three concepts from TRL1 to 2

Meet us at the booth in the entrance foyer!

You can also get an ice-scrape for your car which is needed until TopNANO has solved some of the iceing problems ☺

We will come back and report at future Winterwind conferences

TopNANO researchers Josefina Lindqvist and Mikael Järn looking forward to help solving deiceing

Links:

http://www.toppforskningsinitiativet.org/en/nyheter-1/nanoteknik-hjaelp-mot-nedisning
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