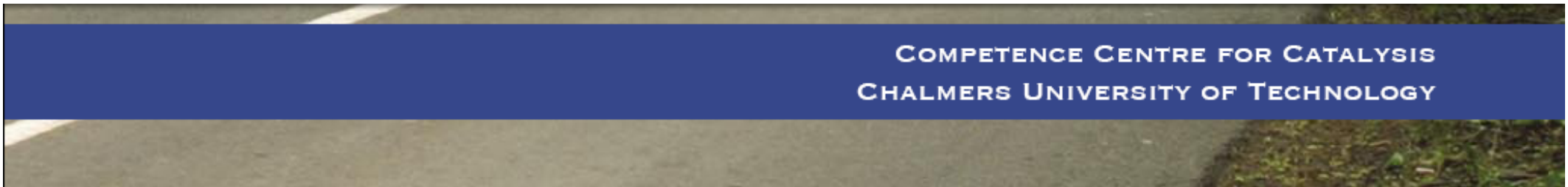
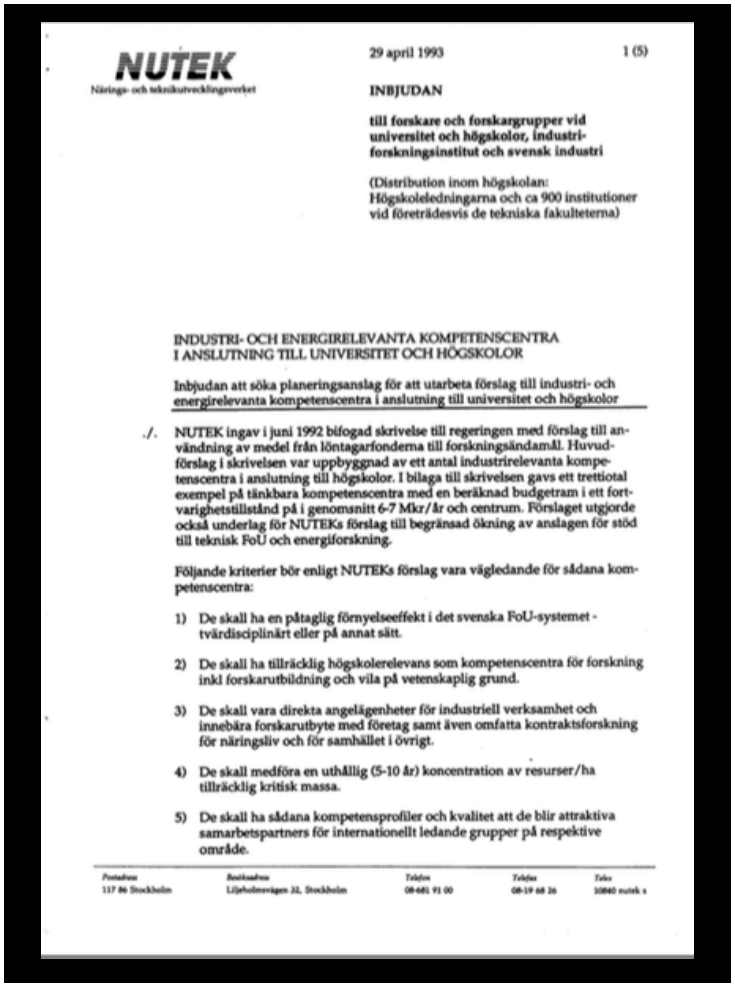
How can an academic research center be a link between industry and facilities?

Mars 13, 2017, Lunds Stadshall, Sweden

Workshop: How can industry make use of the tools available at MAX IV & ESS?



Planning call from NUTEK 1993



NUTEK
Närings- och teknikutvecklingsverket

29 april 1993 1 (5)

INBJUDAN

till forskare och forskargrupper vid universitet och högskolor, industriforskningsinstitut och svensk industri

(Distribution inom högskolan: Högskoleledningarna och ca 900 institutioner vid företrädesvis de tekniska fakulteterna)

INDUSTRI- OCH ENERGIRELEVANTA KOMPETENSCENTRA I ANSLUTNING TILL UNIVERSITET OCH HÖGSKOLOR

Inbjudan att söka planeringsanslag för att utarbeta förslag till industri- och energirelevanta kompetenscentra i anslutning till universitet och högskolor

./. NUTEK ingav i juni 1992 bifogad skrivelse till regeringen med förslag till användning av medel från löntagarfonderna till forskningsändamål. Huvudförslag i skrivelsen var uppbyggnad av ett antal industrirelevanta kompetenscentra i anslutning till högskolor. I bilaga till skrivelsen gavs ett trettiotal exempel på tänkbara kompetenscentra med en beräknad budgetram i ett fortvarighetstillstånd på i genomsnitt 6-7 Mkr/år och centrum. Förslaget utgjorde också underlag för NUTEKs förslag till begränsad ökning av anslagen för stöd till teknisk FoU och energiforskning.

Följande kriterier bör enligt NUTEKs förslag vara vägledande för sådana kompetenscentra:

1) De skall ha en påtaglig förnyelseeffekt i det svenska FoU-systemet - tvärdisciplinärt eller på annat sätt.

2) De skall ha tillräcklig högskolerelevans som kompetenscentra för forskning inkl forskarutbildning och vila på vetenskaplig grund.

3) De skall vara direkta angelägenheter för industriell verksamhet och innebära forskarutbyte med företag samt även omfatta kontraktsforskning för näringsliv och för samhället i övrigt.

4) De skall medföra en uthållig (5-10 år) koncentration av resurser/ha tillräcklig kritisk massa.

5) De skall ha sådana kompetensprofiler och kvalitet att de blir attraktiva samarbetspartners för internationellt ledande grupper på respektive område.

Postadress 117 86 Stockholm | Besöksadress Liljeholmsvägen 32, Stockholm | Telefon 08-681 91 00 | Telefax 08-19 68 26 | Telex 10840 nutek s

Build ca 30 industrially relevant Competence Centra at Swedish universities that should:

- Have a substantial renewable effect on the Swedish R&D system - being multidisciplinary
- Be directly relevant for industry resulting in research exchange with companies
- Result in a sustainable (5-10 years) concentration of resources and have sufficient critical mass
- Have such competence profiles and quality that the Centra become attractive partners for internationally leading groups in the respective field

NUTEK: Närings-och teknikutvecklings verket

The west coast of Sweden

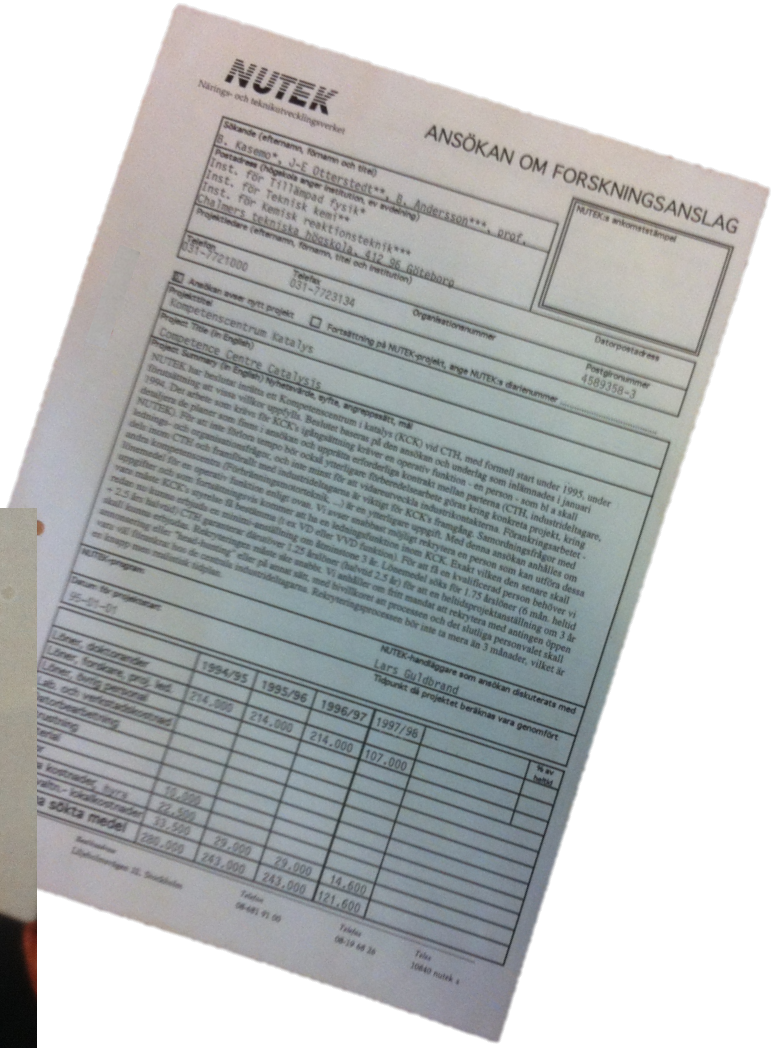
- Academic research on catalysis
- Users of catalytic technologies
- Manufacturers of catalysts

=> Competitive edge within catalysis

B. Andersson

B. Kasemo

J.-E. Otterstedt



CHALMERS
Competence Centre for Catalysis

Kompetenscentrum katalys (KCK) established 1995

Chemical Reaction Engineering

Chemical Physics

Engineering Chemistry

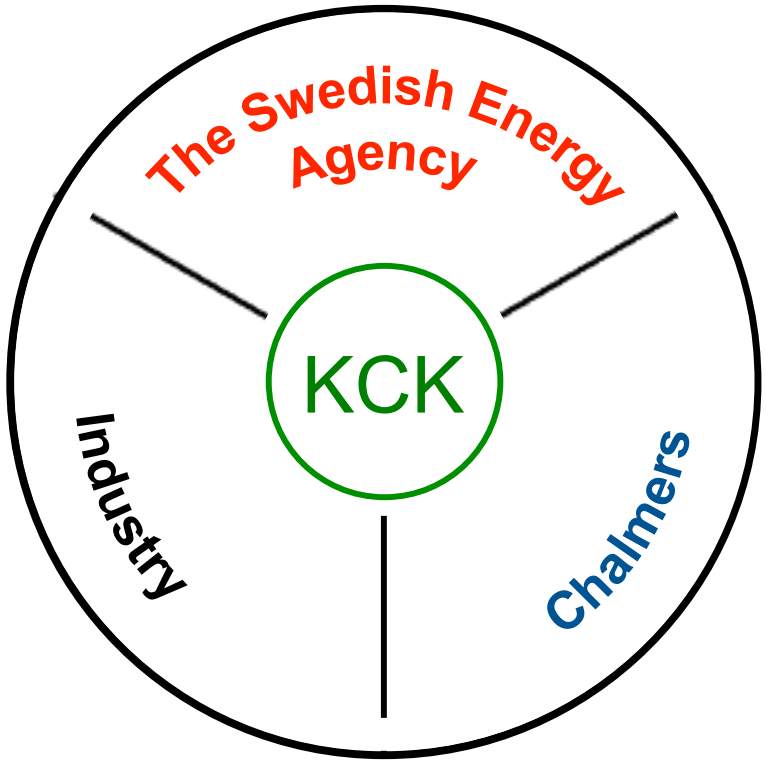


ABB Fläkt

AB Volvo

Emissionsteknik

Perstorp AB

SAAB Automobile AB

Svensk bilprovning

Multidisciplinary environment created

Sten Ljungström
recruited as first director

VISION

Contribute to sustainable transport and energy systems with state-of-the-art catalytic techniques

STRATEGY

Develop professional competence and an efficient organisation for interaction and collaboration with industry and governmental organisations

Perform fundamental research and disseminate the results

Perform applied research that can be exploited by the industrial and governmental partners

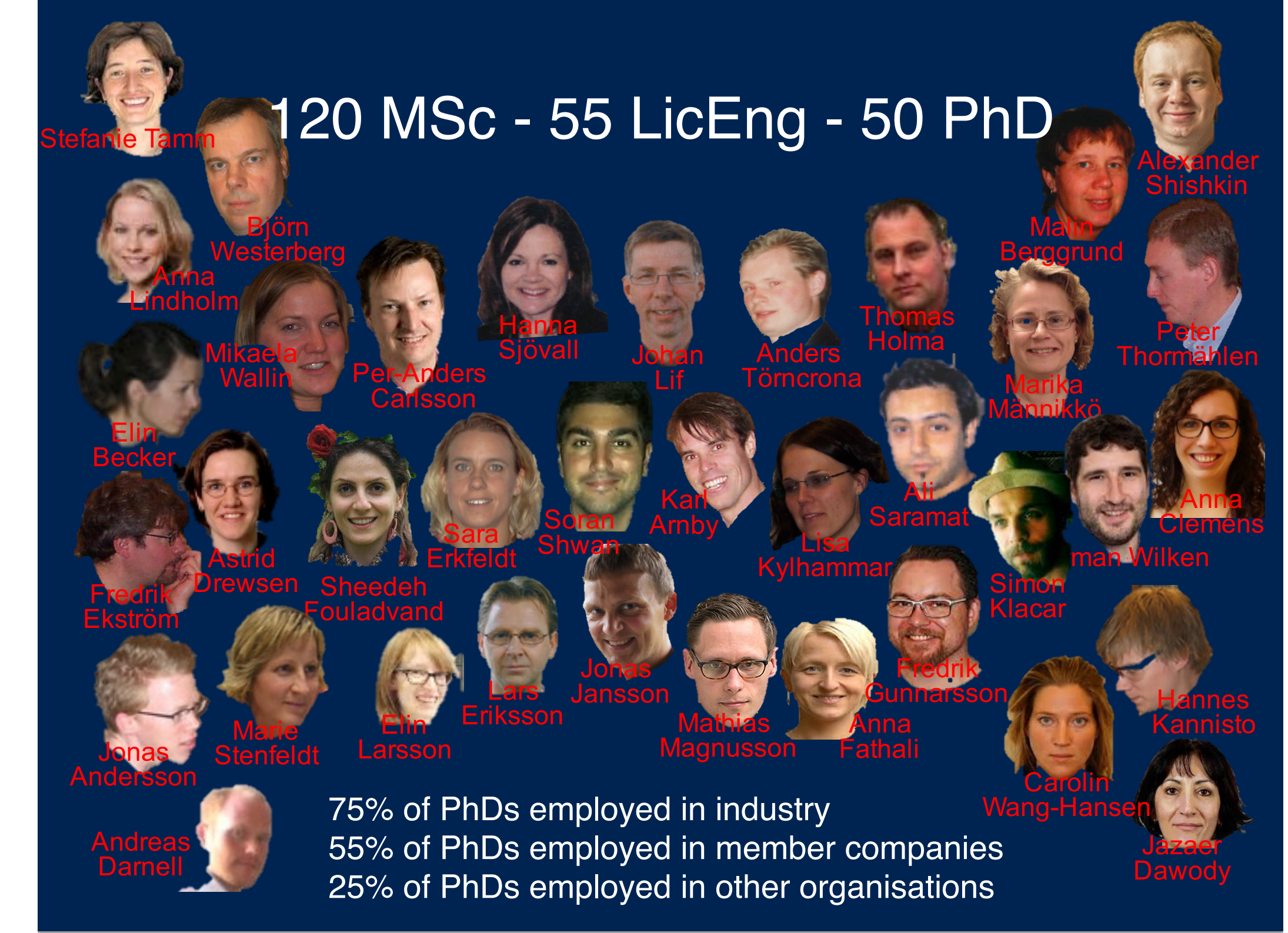
Success criteria

Attractive partner for industry

- Problem formulation and new project ideas
- Long-term commitments by member companies: Economic, Personnel, Technical resources
- Industrial PhD students
- Adjunct Professors from member companies

Gudmund Smedler

Edward Jobson


120 MSc - 55 LicEng - 50 PhD
Stefanie Tamm
Björn Westerberg
Alexander Shishkin
Malin Berggrund
Anna Lindholm
Hanna Sjövall
Johan Lif
Anders Törncrona
Thomas Holma
Peter Thormählen
Mikaela Wallin
Per-Anders Carlsson
Marika Männikkö
Elin Becker
Soran Shwan
Karl Arnby
Ali Saramat
Anna Clemens
Astrid Drewsen
Sheedeh Fouladvand
Sara Erkfeldt
Lisa Kylhammar
man Wilken
Fredrik Ekström
Simon Klacar
Jonas Jansson
Lars Eriksson
Fredrik Gunnarsson
Hannes Kannisto
Jonas Andersson
Marie Stenfeldt
Elin Larsson
Mathias Magnusson
Anna Fathali
Carolin Wang-Hansen
Andreas Darnell
Jazaer Dawody
75% of PhDs employed in industry
55% of PhDs employed in member companies
25% of PhDs employed in other organisations

Success criteria

Attractive partner for industry

Strengthened competence profile

- Leading in environmental catalysis research

Major groups active in the research and development of the NO_x storage-type catalyst
Competence Centre for Catalysis Chalmers University of Technology, Sweden
Laboratoire Gestion des Risques et Environnement Université de Haute Alsace Ecole Nationale Supérieure de Chimie Mulhouse, France
Johnson Matthey Technology Centre, UK
Degussa-Hüls AG, Germany
Engelhard Technologies GmbH, Germany
Ford Motor Company, USA
General Motors Research, USA
Toyota Central Research & Development Laboratories Inc. Japan
Toyota Motor Corporation, Japan

Matsumoto, CATTECH 2000

Early input from member companies (AB Volvo & Johnson Matthey AB)

CHALMERS
Competence Centre for Catalysis

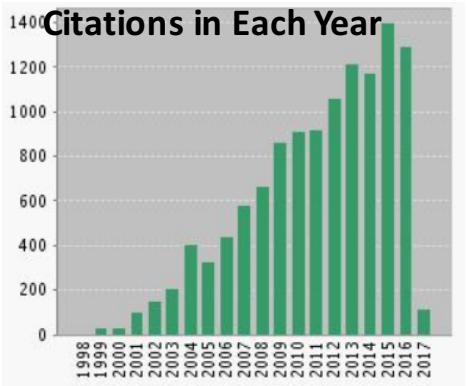
Success criteria

Attractive partner for industry

Strengthened competence profile

- Leading in environmental catalysis research
- Manifested by high number of scientific publications, referee commissions and conference presentation

  h-index: 54, 12,000 citations, cf-value: 1.70

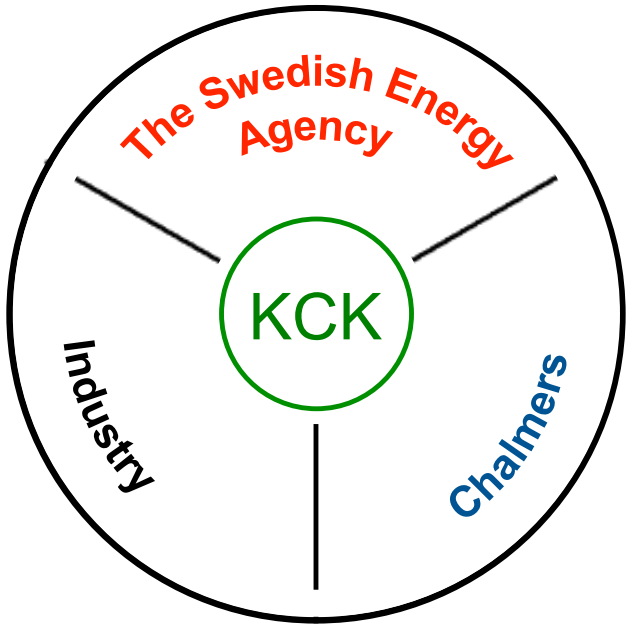


Success criteria

Attractive partner for industry

Strengthened competence profile

New industrial partners



2017 constellation

AB Volvo

ECAPS AB

Haldor Topsøe A/S

Scania CV

Volvo Car Corporation AB

Wärtsilä Finland

10 senior researchers

9 Postdocs

24 PhD students

2 Technicians

Success criteria

Attractive partner for industry

Strengthened competence

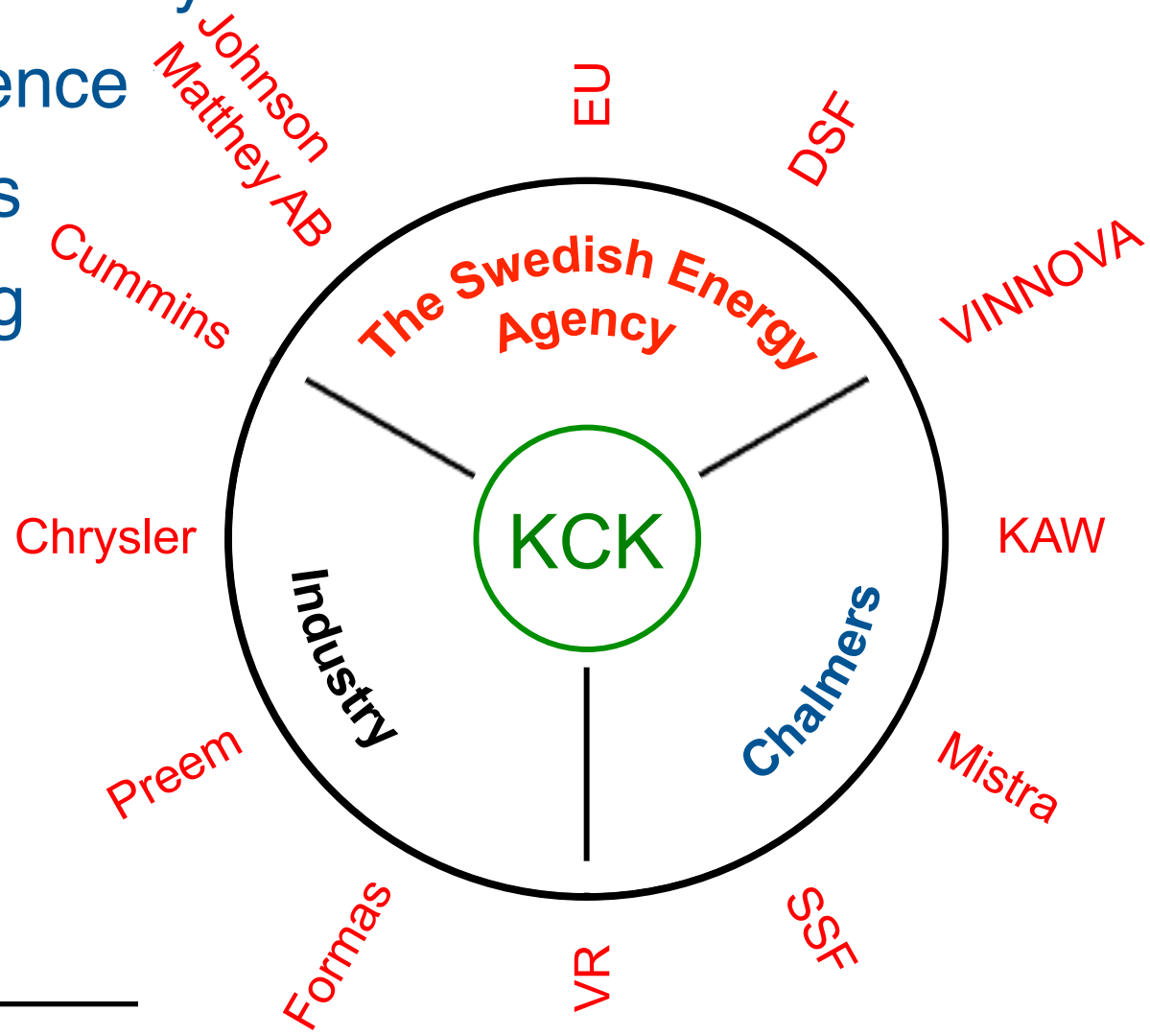
New industrial partners

Attract external funding

2014 figures

Base	12 MSEK/year
External	15 MSEK/year

- Contract projects
- Swedish Energy Agency
- Chalmers



Success criteria

Attractive partner for industry

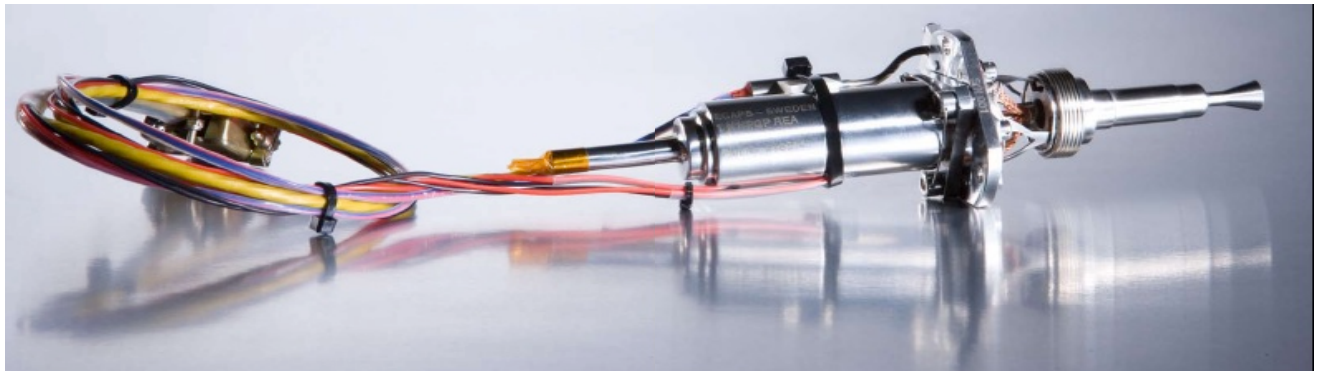
Strengthened competence profile

New industrial partners

Attract external funding

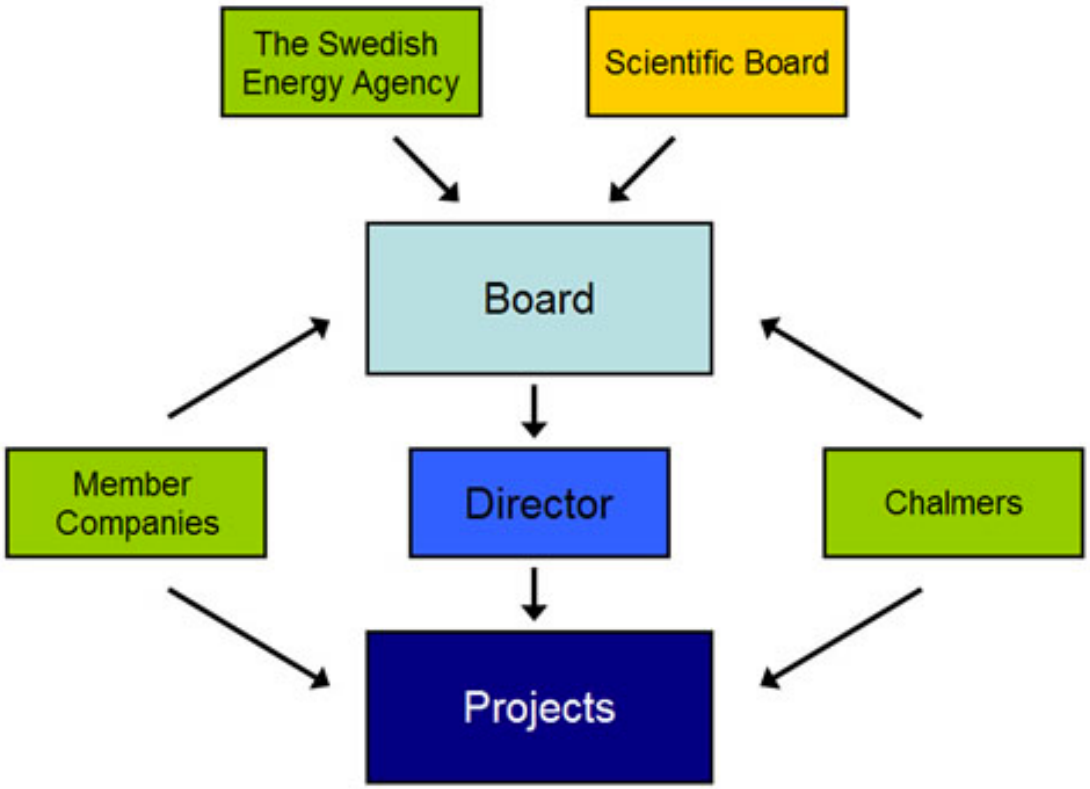
Technology transfer and spinn-off companies

ECAPS AB - joint venture company formed by the Swedish Space Corporation and Volvo Aero. New Satellite rocket engine system running on a new environmentally friendly fuel. High-temp. stable combustion catalyst developed in close cooperation with KCK



CHALMERS
Competence Centre for Catalysis

Organisation: from ideas to projects



SCIENTIFIC BOARD (advisors)

Galen Fisher
Senior Scientific Advisor,
Department of Chemical Engineering,
Univ. of Michigan, USA.

Ib Chorkendorff
CINF, Danmarks Tekniske Universitet,
Kongens Lyngby, Denmark.

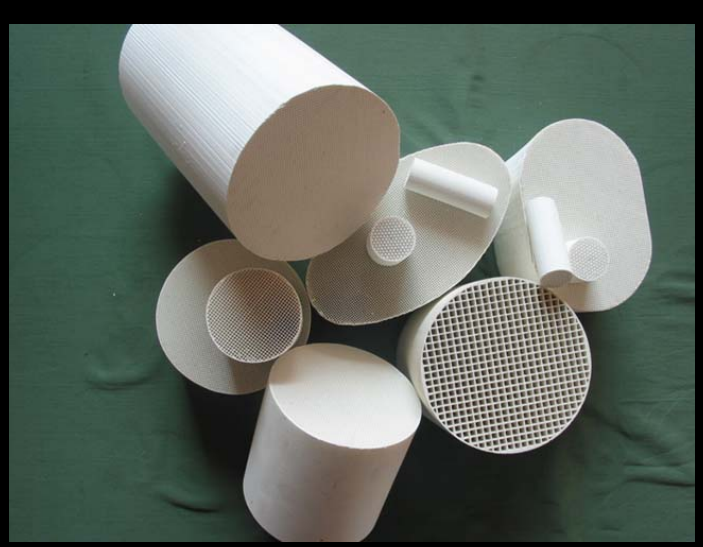
Enrico Tronconi
Dipartimento di Chimica Industriale e Ingegneria Chimica Politecnico di Milano, Italy.

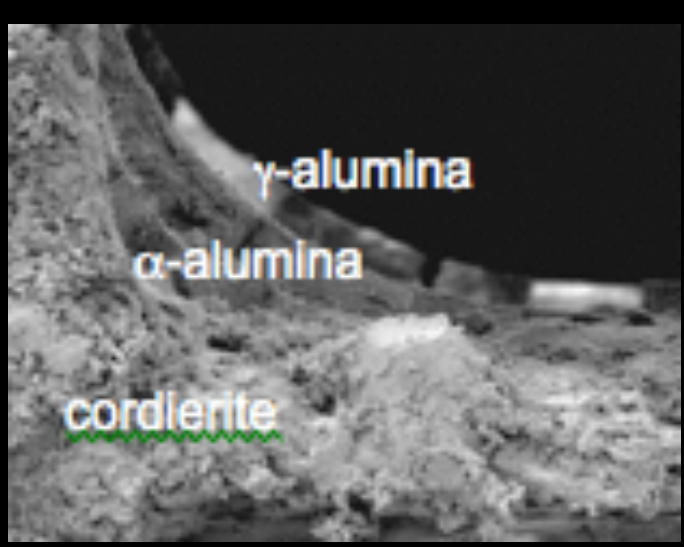
Christine Lamberts
Ford Motor Company, Dearborn, USA

How can an academic research center be a link between industry and facilities?

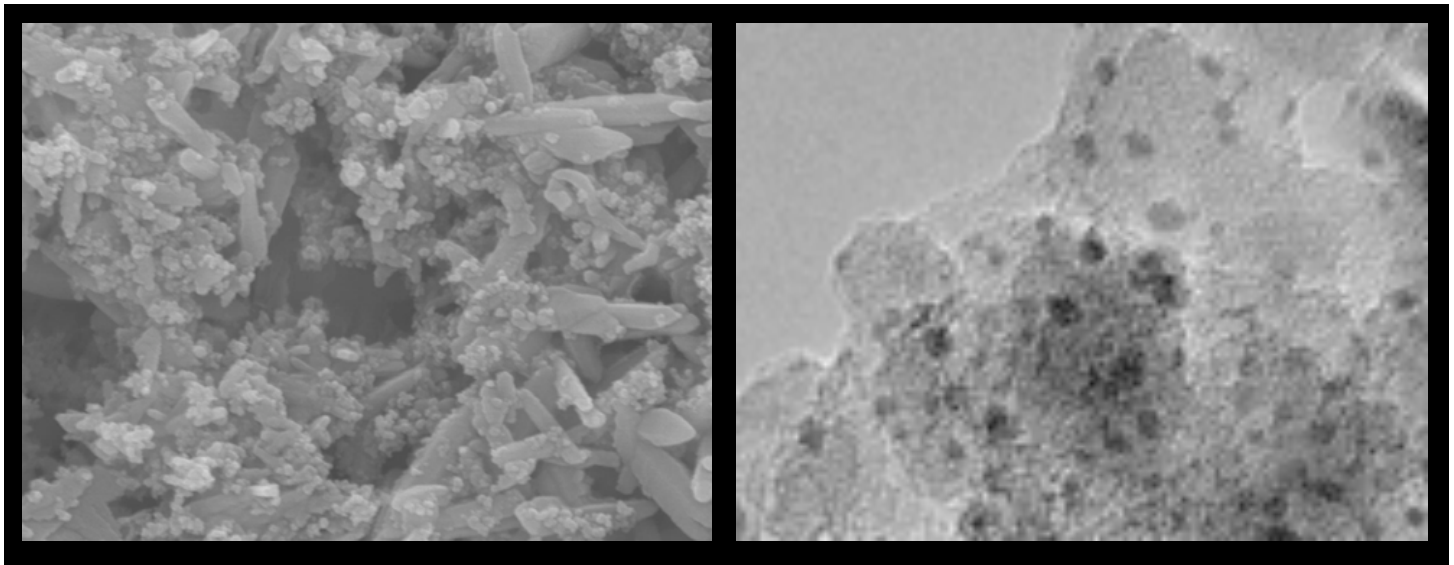
- Continuous communication between involved partners as for the entire network cannot be underestimated
- Balance generic (learning) activities with relevant projects for industry such that a facility is used in a fruitful way
- The competence network can be well utilised to initiate projects and to disseminate the results
- Joint projects with mutual participation
- Attract funding to develop experimental stations at facilities satisfying both academic and industrial needs
- Act as an “ambassador” for facilities towards industry

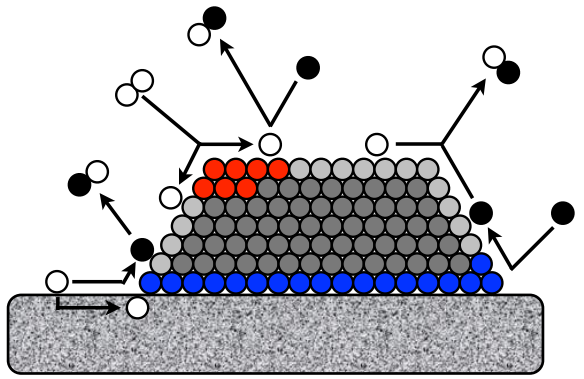
One minute course in automotive catalysis



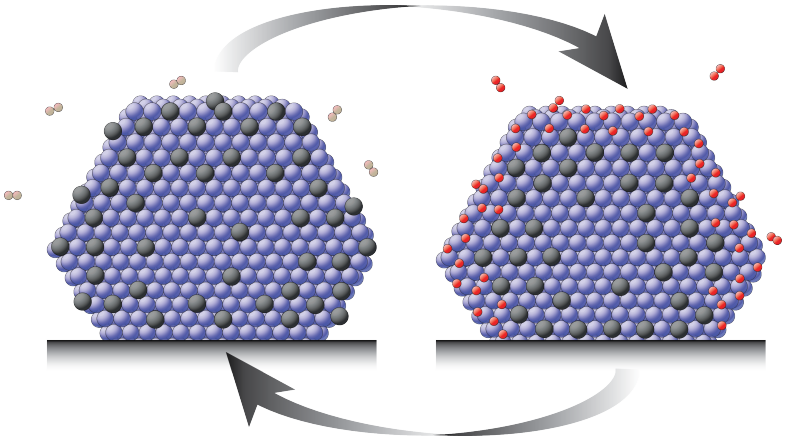


The supported catalyst





EXAMPLE 1



1. Johnsson Matthey AB initiated discussions:

   We need fundamental understanding -

   trial-and-error approach is insufficient !

2. Joint application formulated and accepted and a PhD student was hired.
3. KCK coordinated with a present VR funded post-doc project

   => create extra value & use of facilities !

THE JOURNAL OF PHYSICAL CHEMISTRY C

Article

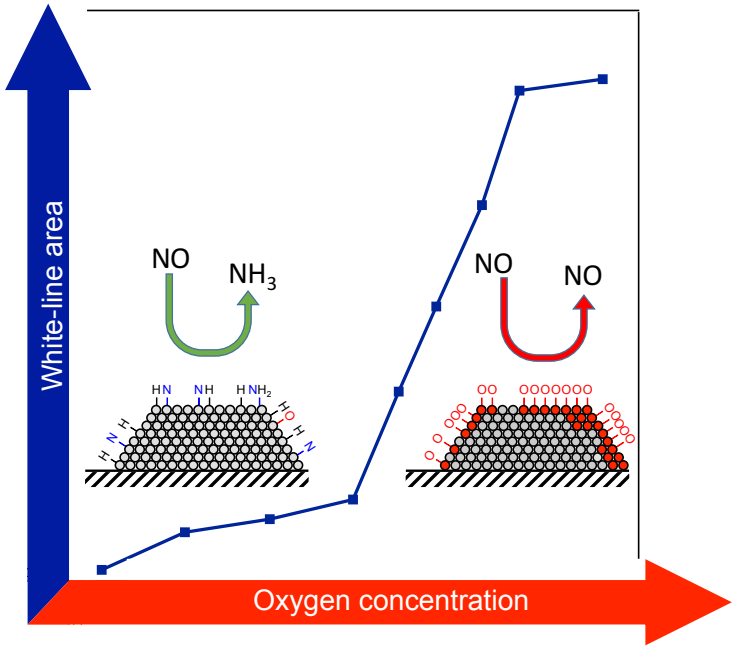
pubs.acs.org/JPCC

Characterization of Surface Structure and Oxidation/Reduction Behavior of Pd–Pt/Al_2O_3 Model Catalysts

Natalia M. Martin,*[,†] Johan Nilsson,[†] Magnus Skoglundh,[†] Emma C. Adams,[†] Xueting Wang,[†] Peter Velin,[†] Gudmund Smedler,[‡] Agnes Raj,[§] David Thompsett,[§] Hidde H. Brongersma,[∥] Thomas Grehl,[⊥] Giovanni Agostini,[#] Olivier Mathon,[#] Stefan Carlson,[%] Katarina Norén,[%] Francisco J. Martinez-Casado,[%] Zdenek Matej,[%] Olivier Balmes,[%] and Per-Anders Carlsson[†]

EXAMPLE 2

1. Emerging technology for NO_x abatement?
2. Two joint applications (3+3 years):
   - **Volvo Car Corporation AB**
   - Haldor Topsøe A/S
   - KCK and CERC
3. Research at facilities was promoted by KCK



PCCP

COMMUNICATION

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The structure–function relationship for alumina supported platinum during the formation of ammonia from nitrogen oxide and hydrogen in the presence of oxygen

Emma Catherine Adams,*[a] Lindsay Richard Merte,[b] Anders Hellman,[a] Magnus Skoglundh,[a] Johan Gustafson,[b] Eva Charlotte Bendixen,[c] Pär Gabrielsson,[c] Florian Bertram,[b] Jonas Evertsson,[b] Chu Zhang,[b] Stefan Carlson[b] and Per-Anders Carlsson[a]

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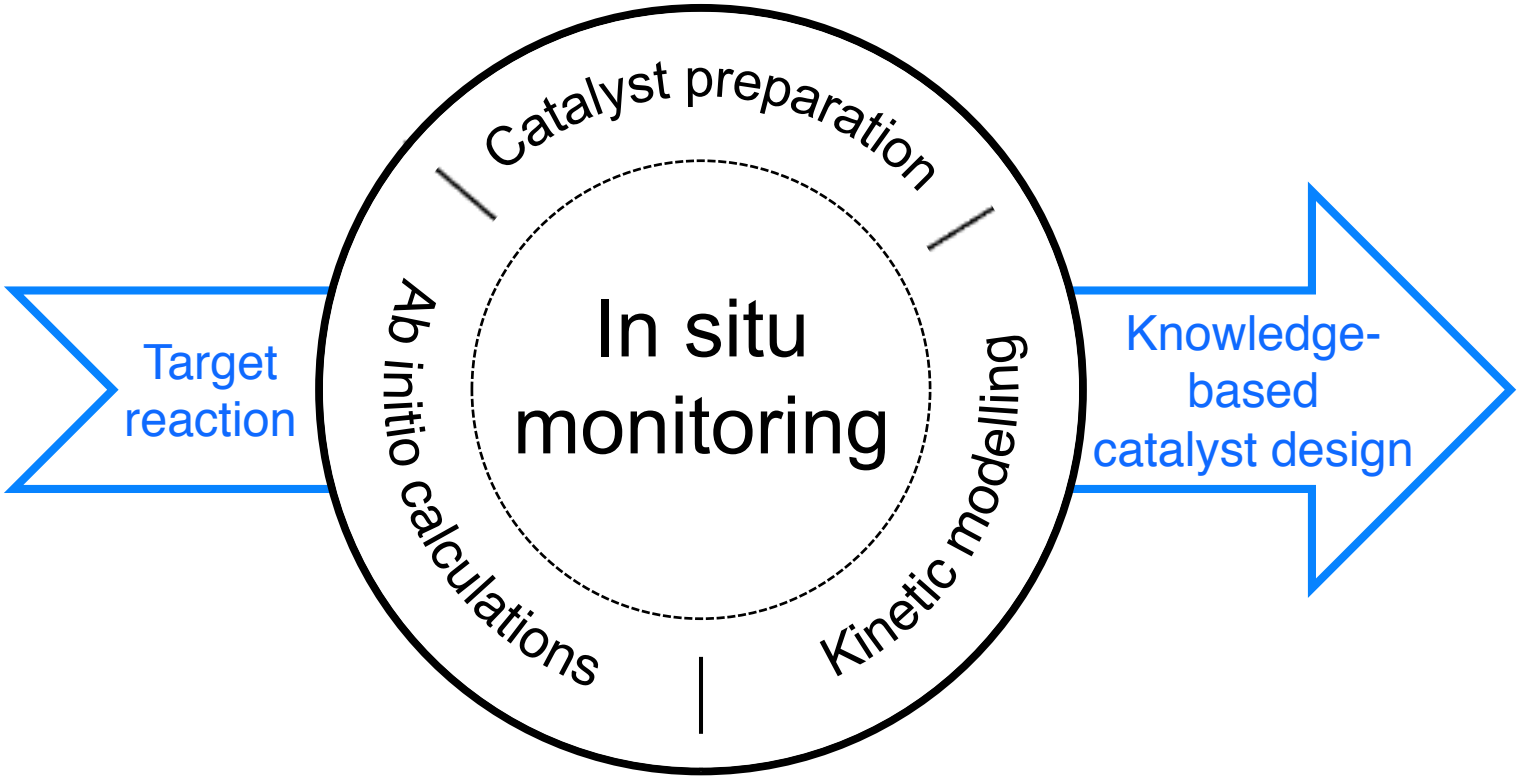
www.rsc.org/pccp

KCK encourages use of facilities for development of new catalysts/processes



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M. Skoglundh
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K. Norén
Z. Matej

ESRF

G. Agostini
O. Mathon

Johnson Matthey

G. Smedler
A. Raj
D. Thompsett

IONTOF

T. Grehl
P. Bruner
H. H. Brongersma

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