



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Bundesamt für Energie BFE  
Office fédéral de l'énergie OFEN  
Ufficio federale dell'energia UFE  
Swiss Federal Office of Energy SFOE

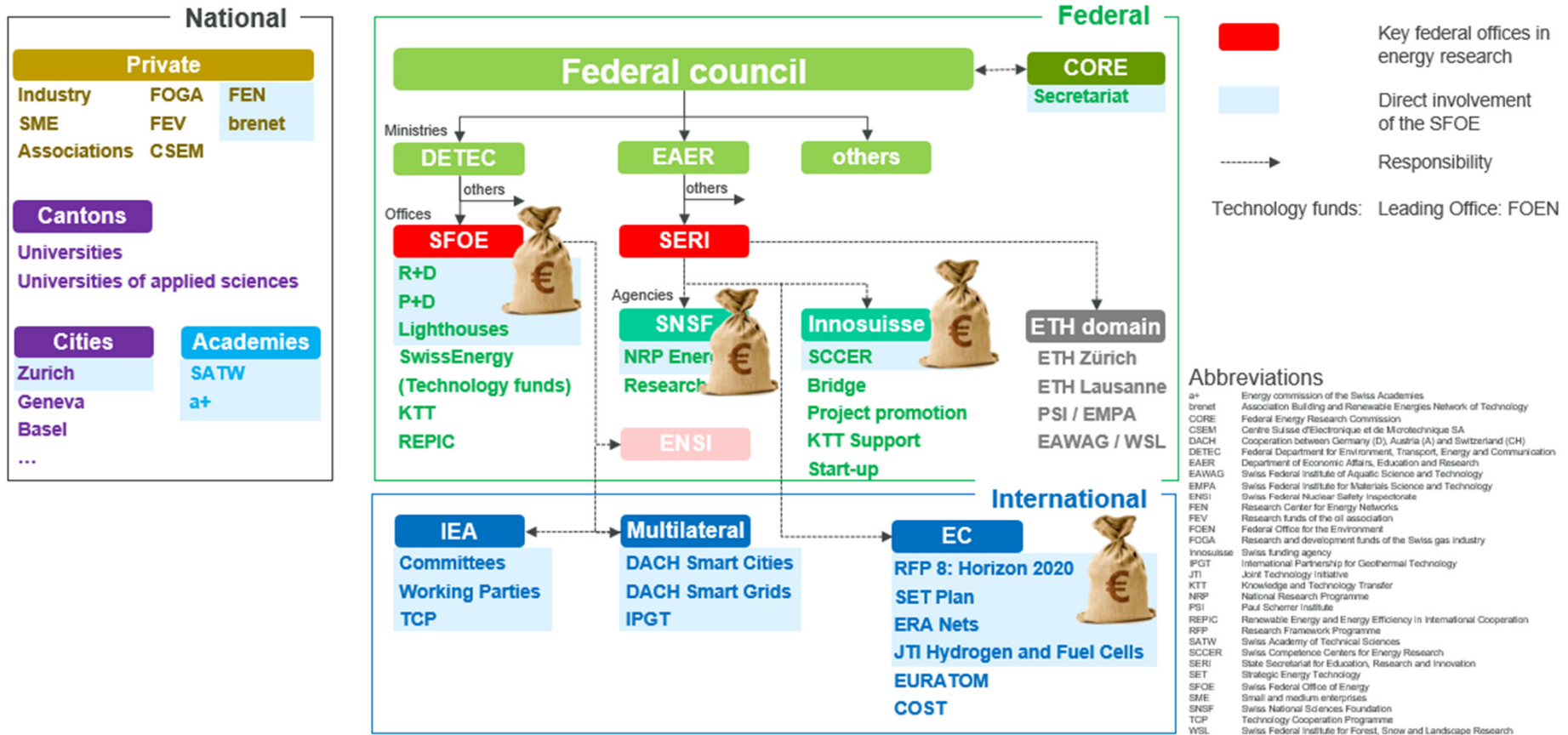


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# ENERGY RESEARCH IN SWITZERLAND SWISS FEDERAL OFFICE OF ENERGY

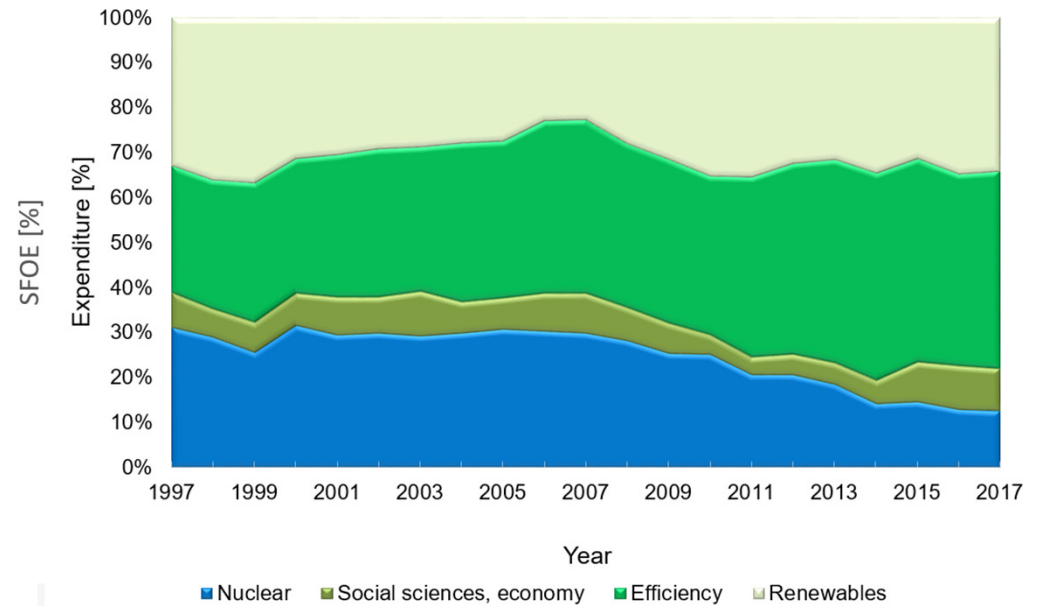
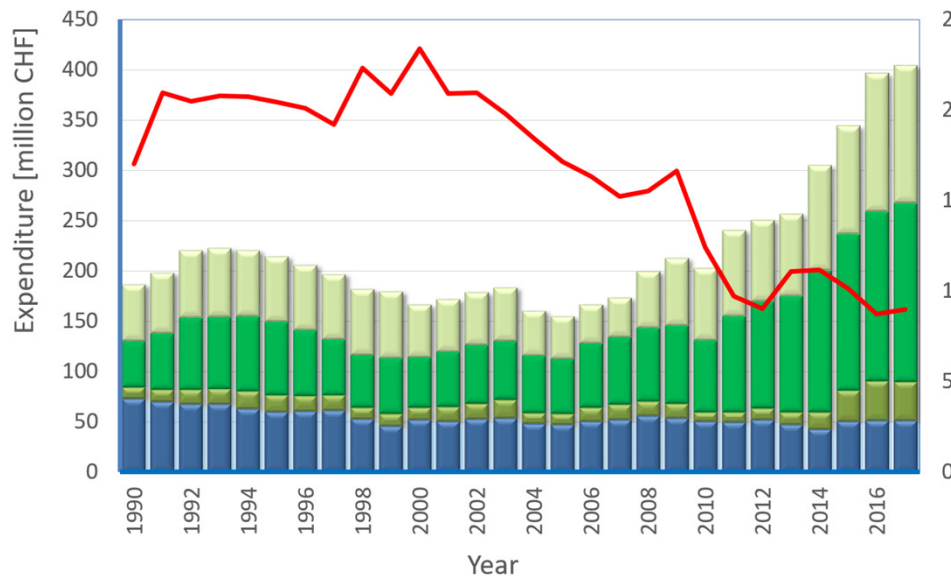


# STAKEHOLDERS IN THE SWISS ENERGY RESEARCH ECOSYSTEM





# DEVELOPMENT OF PUBLIC EXPENDITURE

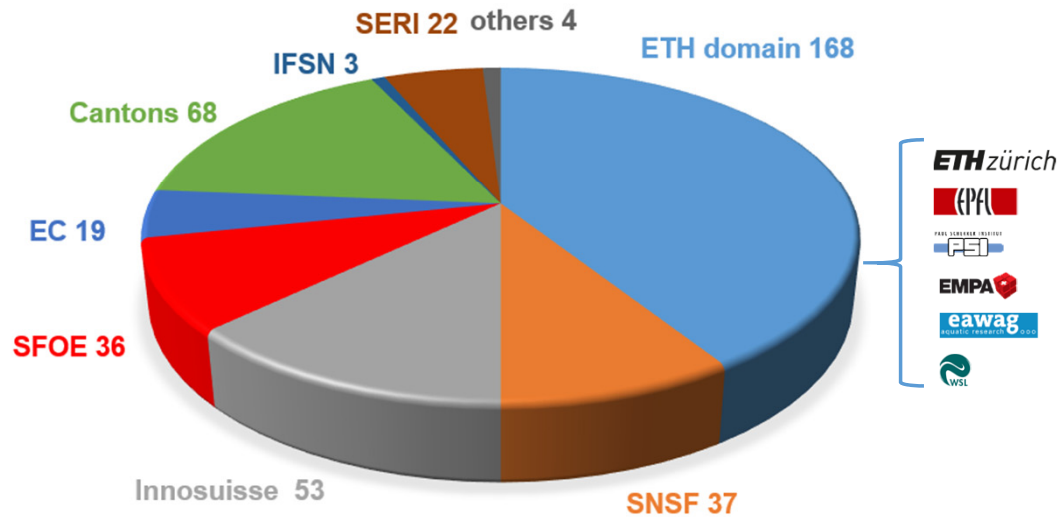




# SOURCES OF PUBLIC FUNDING

Public expenditure for energy research 2017:  
410 million CHF

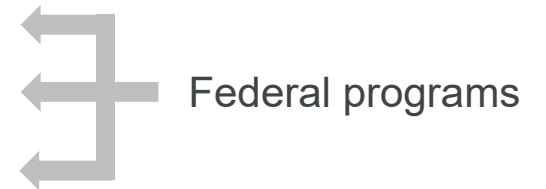
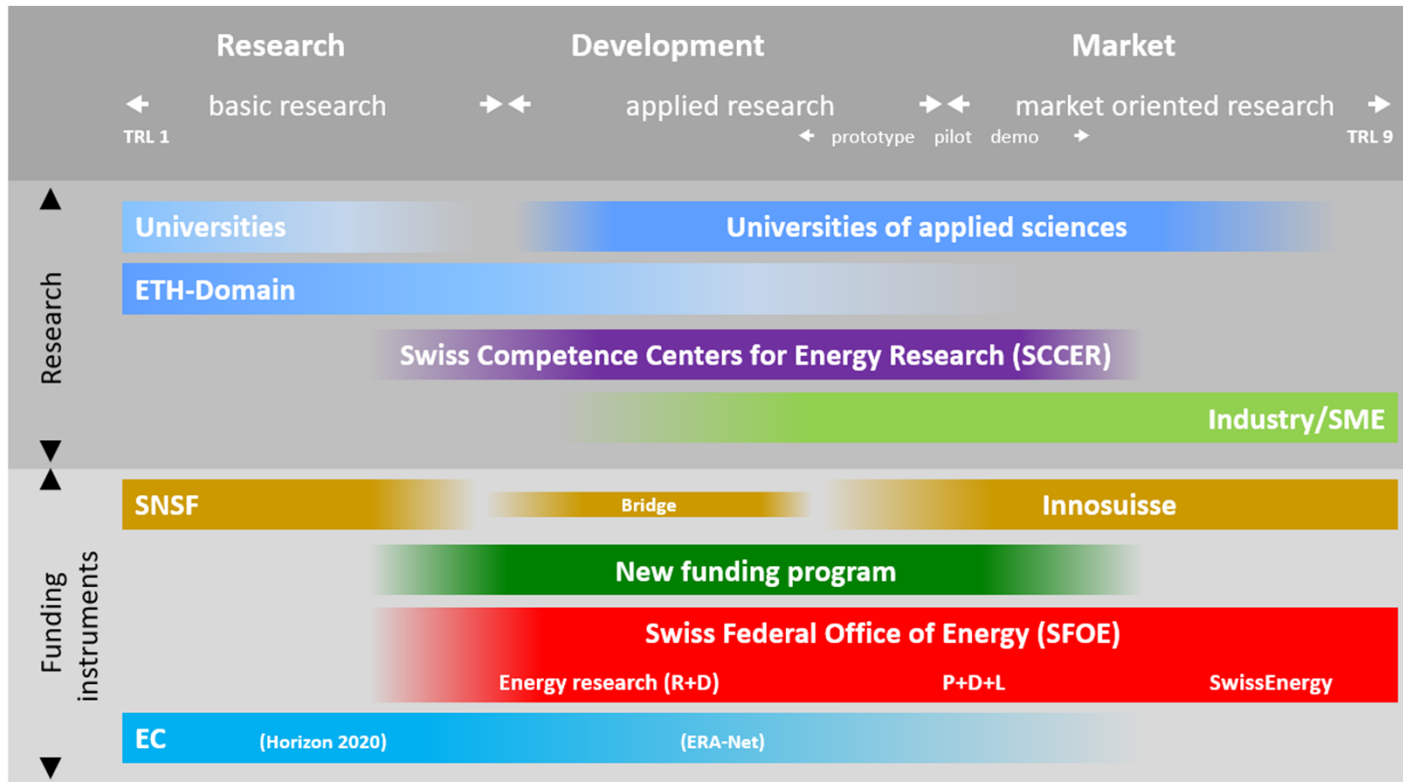
ETH domain 41.0 %  
 SNSF 9.0 %  
 Innosuisse 12.9 %  
 SFOE 8.8 %  
 EC 4.6 %  
 Cantons 16.6 %  
 IFSN 0.7 %  
 SERI 5.4 %  
 others 1.0 %



Values in million CHF

<b>Cantons</b>		<b>64.5 million CHF</b>
Universities		24.3 million CHF
Universities of applied sciences		32.4 million CHF
others		7.8 million CHF

# RESEARCH LANDSCAPE IN SWITZERLAND



SNSF: Swiss National Science Foundation  
 CTI: Commission for Technology and Innovation  
 TRL: Technology Readiness Levels

SME: Small and medium-sized enterprises  
 R+D: Research and development

ERA-Net CFA: European Research Area Network  
 P+D+L: Pilot, demonstration and light house projects



# RESEARCH PROGRAMMES OF THE SFOE

**SFOE: Energy research project funding of more than 50 million Swiss francs per year**

**Staff: 15 scientist and 7 mandated scientific program managers**

## **RENEWABLES (~6½ MCHF)**

- Bioenergy
- Geothermal energy
- Solar energy at high temperature
- Photovoltaics
- Solar heat and heat storage
- Hydropower
- Hydrogen
- Wind energy

## **SOCIETY AND ECONOMY (~2 MCHF)**

- Energy–Economy–Society
- Dams (focus: safety)
- Radioactive waste (focus: participation)

## **ENERGY EFFICIENCY (~8½ MCHF)**

- Fuel cells
- Electricity technologies
- Buildings and cities
- Grids
- Combustion based energy systems
- Industrial processes
- Mobility
- Heat pumping technologies and cold energy

## **P+D+L (35 MCHF)**

- Pilot, demonstration and light house projects

## **COORDINATION AND KTT (~½ MCHF)**



# INTERNATIONAL COORDINATION BY SFOE

## IEA: International Energy Agency

Participation of Switzerland in 22 out of 38 Technology Collaboration Programmes (TCP)

Advanced Fuel Cells

Advanced Motor Fuels

Bioenergy

### Demand Side Management

Energy Efficient End-Use Equipment

Emissions Reduction in Combustion

Energy in Buildings and Communities

Energy storage

Energy Technology Systems Analysis Programme

Gas and Oil Technologies

Geothermal Energy Research and Technology

Greenhouse Gases

Heat Pumping Technologies

High-Temperature Super Conductivity on the Electric Power Sector

Hybrid and Electric Vehicles Technologies

Hydrogen

Industrial Technologies and Systems

International Smart Grid Action Network

Photovoltaic Power Systems

Solar Heating and Cooling Systems

Solar-PACES

Wind Energy Systems

## EU: European Research Area Network (ERA-Net)

Smart Cities and Communities; Smart Grids; CCS ACT; Solar; Geothermal Energy; Energy efficiency in industry and services, Bioenergy etc.

## Multilateral Cooperation

MoU D-A-CH zu Smart Grids

MoU D-A-CH zu Smart Cities

MoU International Partnership for Geothermal Technology  
(IPGT: CH, USA, AUS, ISL, NZ)



# FUKUSHIMA'S INFLUENCE ON THE SWISS ENERGY RESEARCH

[million CHF]

11th of March 2011 Fukushima

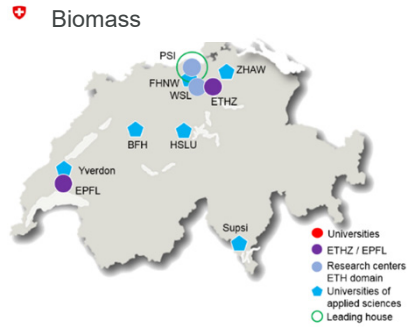
<b>2011</b>	<b>Two National Research Programs on Energy</b>	45 over 5 years
<b>2012</b>	<b>Increase budget for t P&amp;D and Light house program</b>	35 per year
<b>2013</b>	<b>Action plan Coordinated Energy Research Switzerland</b>	202 over 4 years
	<i>Establishment of 8 SCCER</i>	72 over 4 years
	<i>Competitive promotion program</i>	46 over 4 years
	<i>ETH domain: Capacity building (20), and infrastructure (40)</i>	60 over 4 years
	<i>Professorships (SNSF)</i>	24 over 4 years
<b>2016</b>	<b>2<sup>nd</sup> Phase of SCCER</b>	139 over 4 years
	<i>Capacity building SCCER</i>	119 over 4 years
	<i>Competitive promotion program</i>	20 over 4 years
<b>2020</b>	<b>New Promotion Programm Energy (proposal)</b>	22 per years



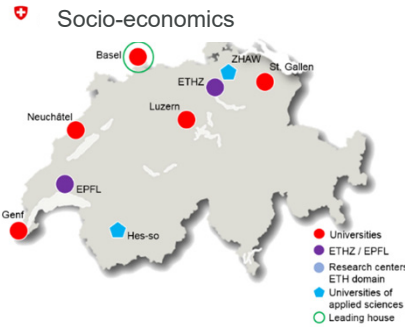


# 8 NEW SWISS COMPETENCE CENTERS IN ENERGY RESEARCH (SCCER)

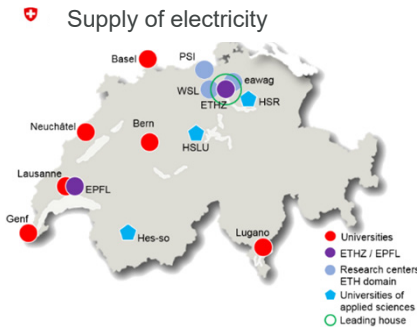
## Biosweet



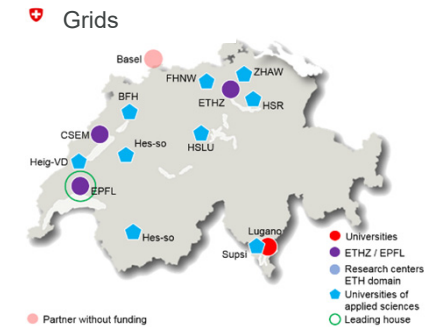
## CREST



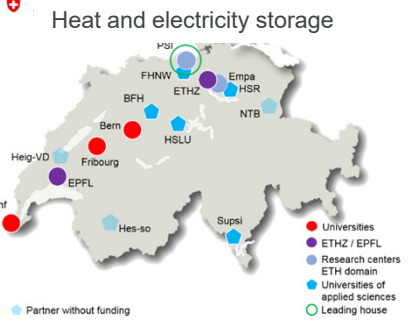
## SoE



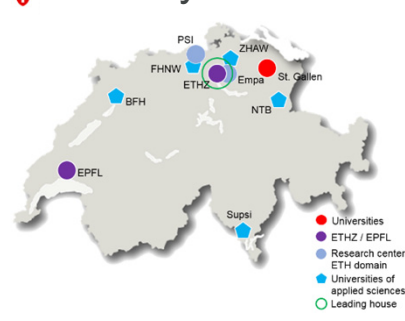
## FURIES



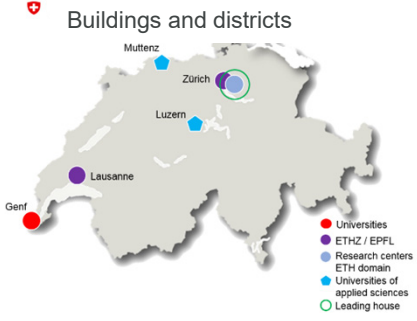
## HaE



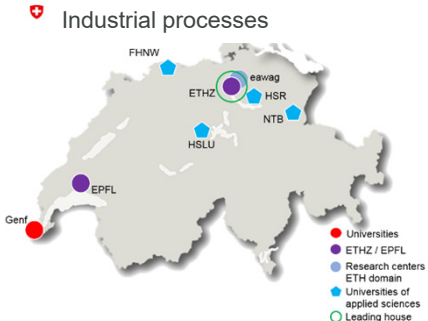
## Mobility



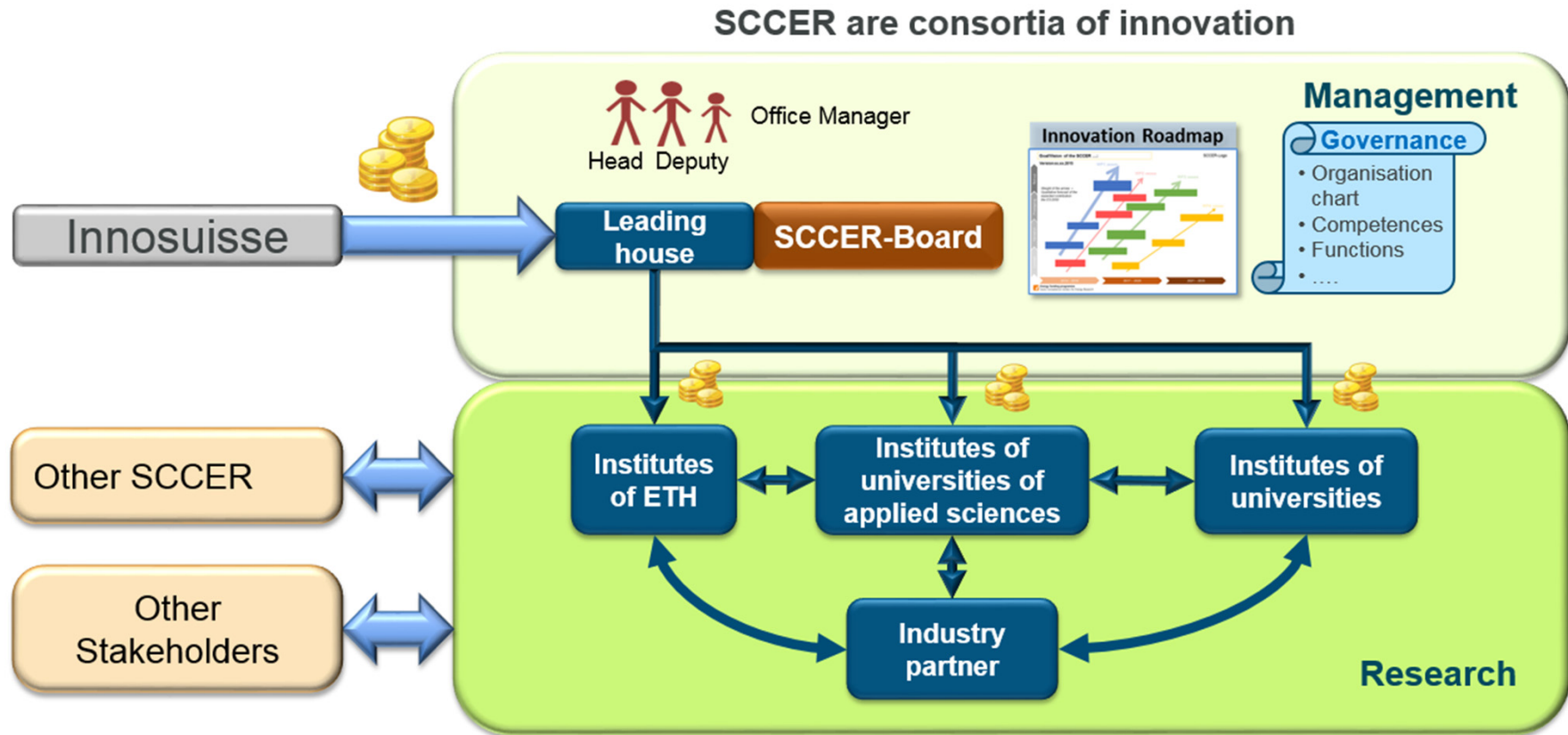
## FEED&D



## EIP



# SCCER: COORDINATION OF RESEARCH ACTIVITIES





# CHARACTERISTICS OF THE SCCER

**Close cooperation between all types of universities**

**Universities of applied sciences: Benchmark is ETH domain**

**Better international cooperations for universities of applied sciences**

**Bundeling of forces: 6 joint activities between SCCER**

Scenarios & Modelling initiative (8)

Coherent energy demonstrator assessment (4)

Whitepaper «Power to Product» technologies in Switzerland (5)

Socio-economic and technical planning of multi-energy systems (3)

Processes for hydro and geothermal projects (2)

Socio-economic analysis of the evolution of mobility (2)

**Strong involvement of industry partners (more than 900 cooperations)**

**Leverage of funding: from 72 million Swiss Francs to 247 million Swiss Francs (2013–2016)**  
(contributions from industry, funding agencies, in-kind etc.)

**One single contact address for industry/SME and Government**

**Visibility towards the parliament (e.g. white papers)**



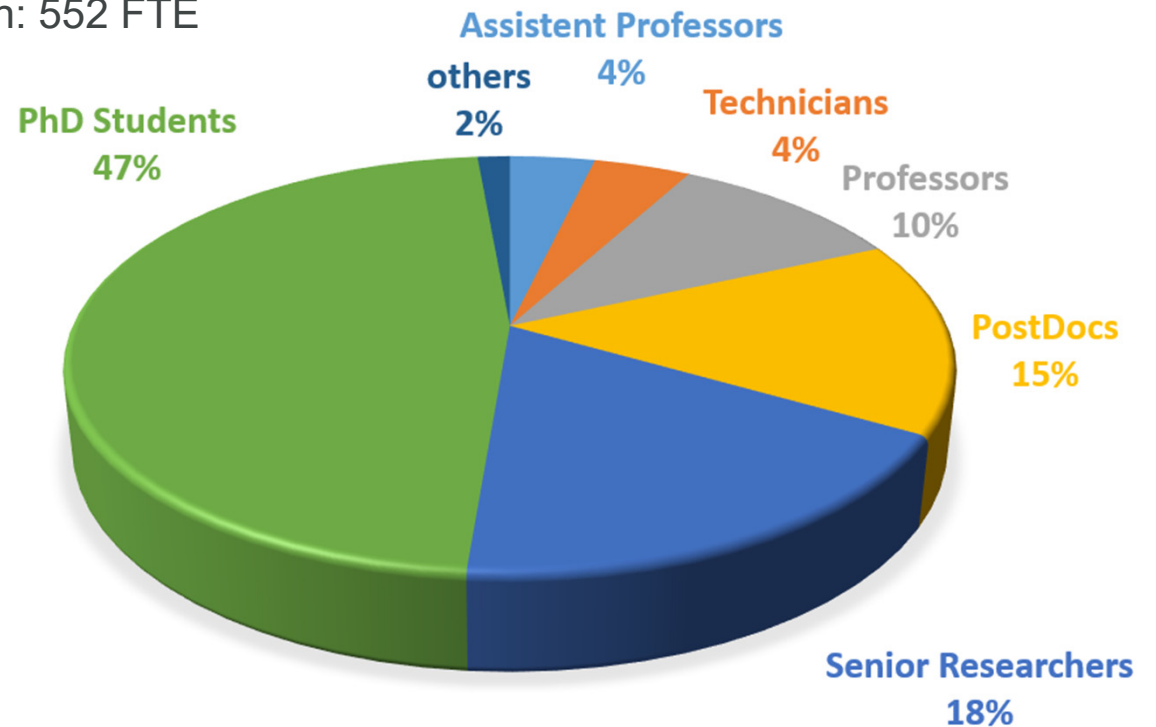
# CAPACITY BUILDING ENERGY ATTRACTIVE FOR RESEARCHERS

## Capacity building

End 2016: 1214 researchers (786 FTE); plan: 552 FTE

End 2018: 1351 researchers (878 FTE)

Total more than 500 research projects

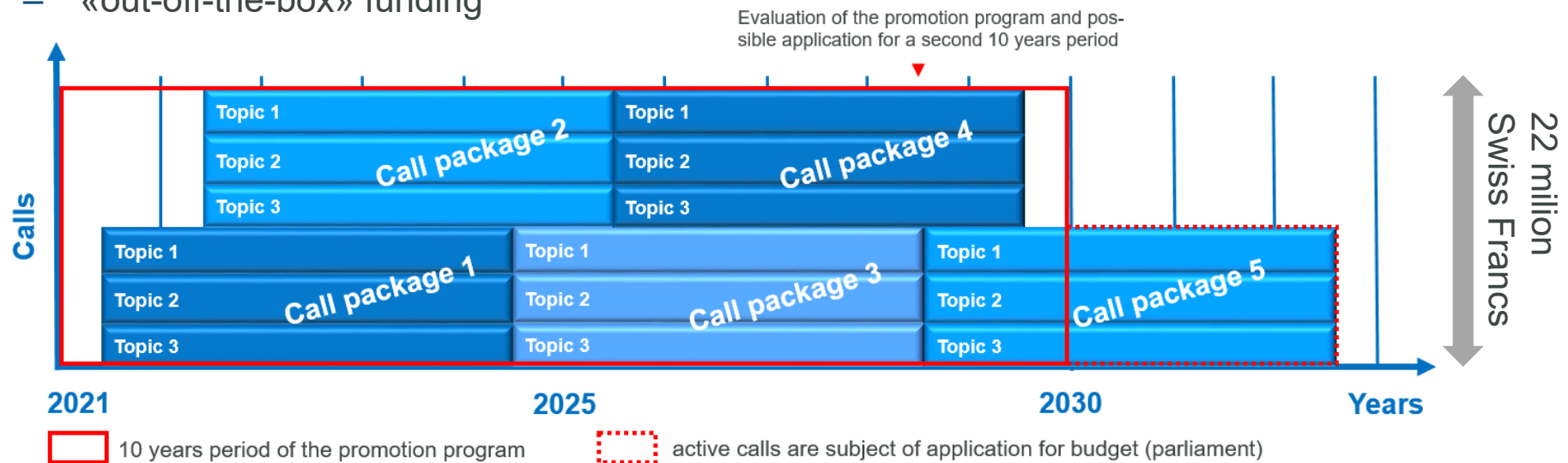




# WHAT WILL BE AFTER 2020?

## SFOE will propose a new promotion program

- no further capacity building
- 10 years duration with possible application for one additional 10 years period
- 22 million Swiss Francs per year
- inter- and transdisciplinary consortial projects
- periodic thematic and competitive calls
- «out-off-the-box» funding





# ENJOY SWITZERLAND

