



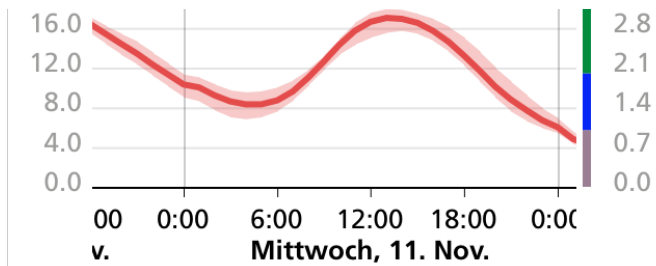
Energy Research in Switzerland



Dr. Rolf Schmitz



Stay in Switzerland





New Energy Strategy of Switzerland

11th of March 2011: Fukushima





Consequences for Energy Research

Federal Council and Parliament strengthen Energy Research

- 25th of May 2011: The Federal Council...
 - ▶ *decides to phase out nuclear power*
 - ▶ *declares launch of National Research Programs dedicated to «Energy» exclusively (45 MCHF over 5 years)*
 - ▶ *decides to develop an Swiss Energy Research Action Plan*
- 18th of April 2012: The Federal Council...
 - ▶ *increases budget for P+D from 5 to 25 MCHF per year*
 - ▶ *launches a «light house program»: 10 MCHF per year (until 2022)*
- 22th of March 2013: Parliament...
 - ▶ *adopts the Swiss Energy Research Action Plan: 202 MCHF for four years*



Action Plan Co-ordinated Energy Research Switzerland

Promotion for the Period 2013–2016

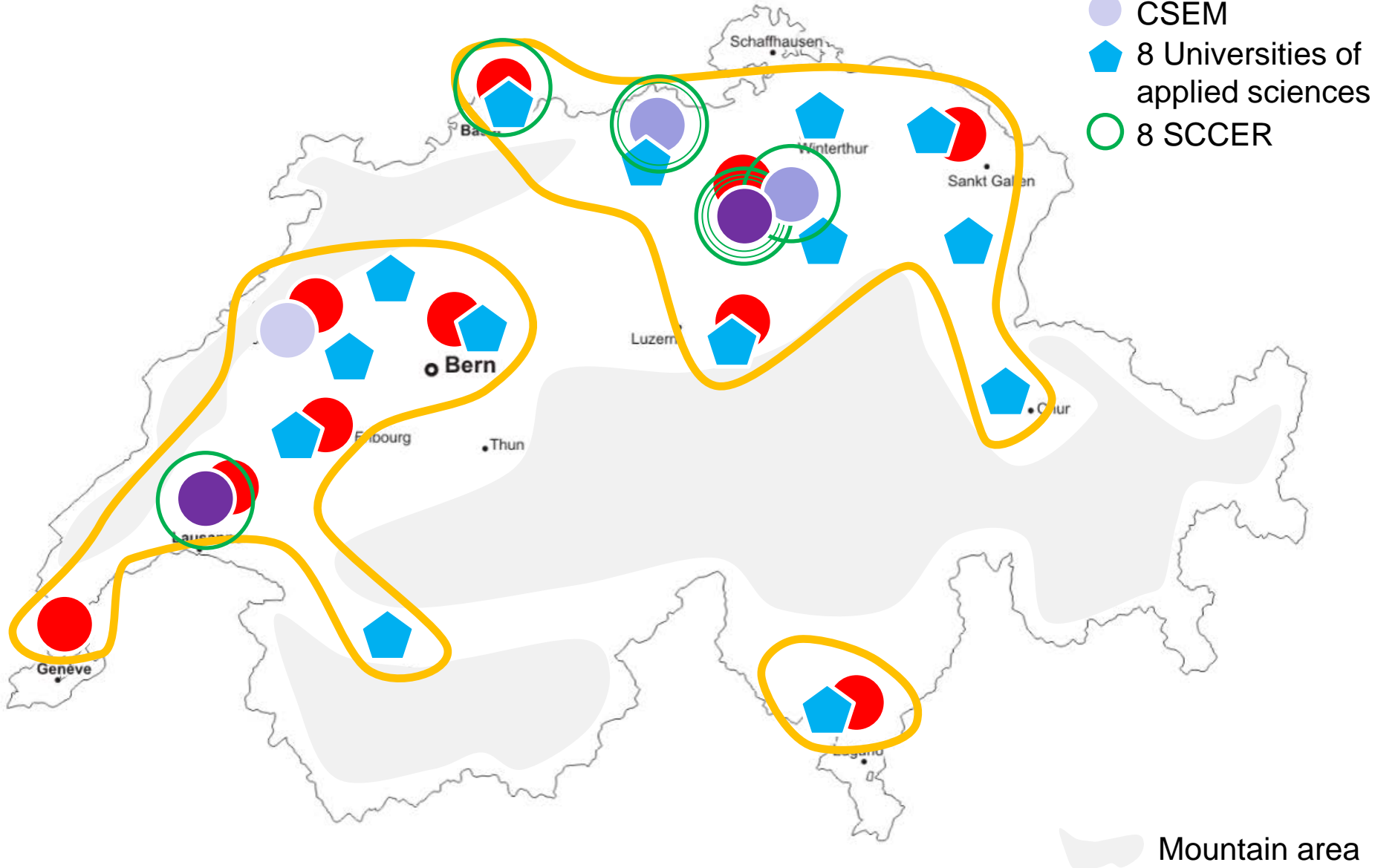
202 MCHF

- 8 new Swiss Competence Centers for Energy Research **72 MCHF**
 - Future Energy Efficient Buildings and Districts
 - Efficiency of Industrial Processes
 - Future Swiss Electrical Infrastructure
 - Heat and Electricity Storage
 - Supply of Electricity
 - Efficient Technologies and Systems for Mobility
 - Biomass for Swiss Energy Future
 - Competence Center for Research in Energy, Society and Transition
- Competitive promotion of projects (CTI) **46 MCHF**
- SNSF professorships **24 MCHF**
- ETH domain **60 MCHF**



Universities with Relation to Energy Research

- 10 Universities
- ETHZ / EPFL
- Research labs
- CSEM
- 8 Universities of applied sciences
- 8 SCCER





Public Expenditure for Energy Research

ETH zürich



PAUL SCHERRER INSTITUT



193 out of 256 million Swiss Francs

Hes·SO
Haute Ecole Spécialisée
de Suisse occidentale



Lucerne University of
Applied Sciences and Arts
**HOCHSCHULE
LUZERN**



Zürcher Hochschule
für Angewandte Wissenschaften
zhaw School of
Engineering



B Berner
Fachhochschule



n|w



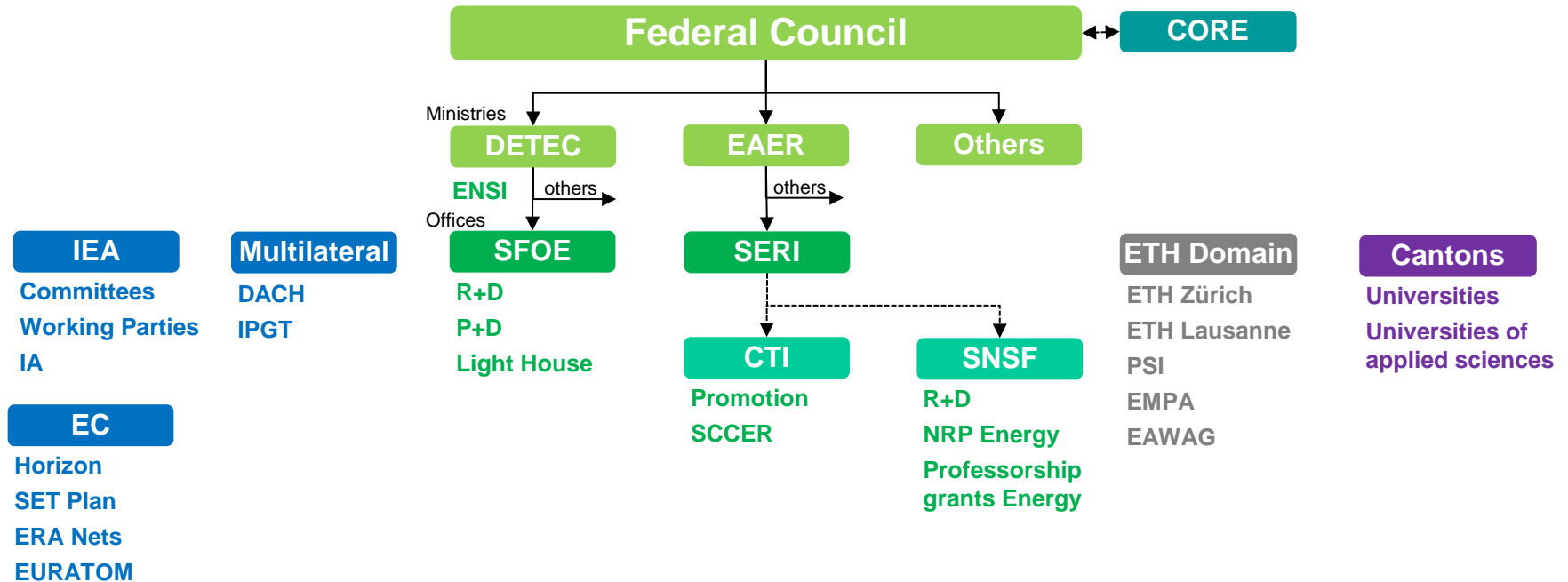
Scuola universitaria professionale
della Svizzera italiana

SUPSI





Overview on Public Actors in Energy Research

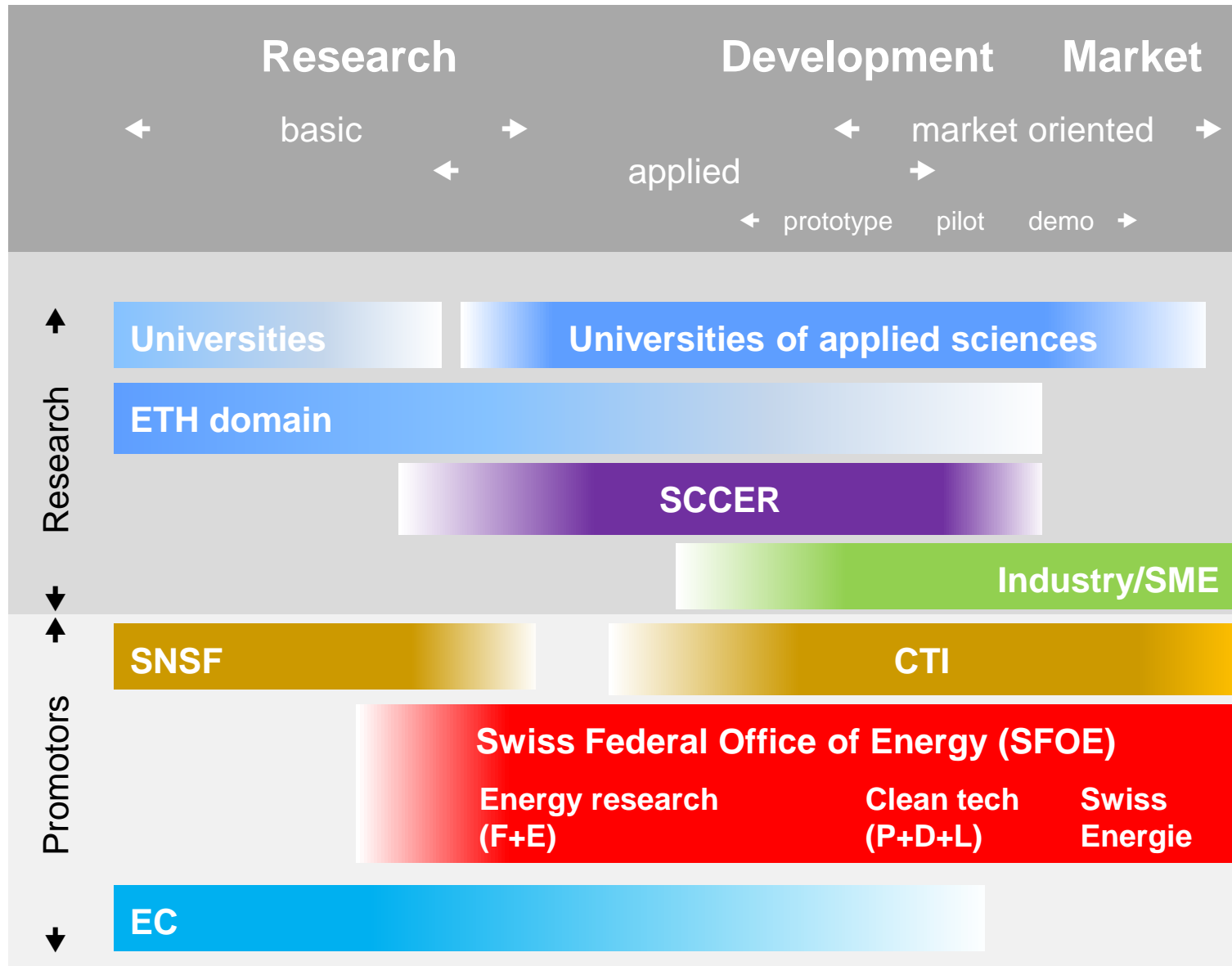


DACH: Cooperation between Germany (D), Austria (CH) and Switzerland (CH)
CORE: Federal Energy Research Commission
CTI: Commission for Technology and Innovation
DETEC: Department of the Environment, Transport, Energy and Communications
EAER: Department of Economic Affairs, Education and Research
EMPA: Federal Laboratories for Materials Science and Technology
ENSI: Swiss Federal Nuclear Safety Inspectorate
FP: Framework Programmes

IA: Implementing Agreements
IPGT: International Partnership for Geothermal Technology
KTT: Knowledge and Technology Transfer
NRP: National Research Programmes
PSI: Paul Scherrer Institute
SCCER: Swiss Competence Centers in Energy Research
SERI: State Secretariat for Education, Research and Innovation
SET: Strategic Energy Technology
SFOE: Swiss Federal Office of Energy
SNSF: Swiss National Science Foundation



Innovation chain: from basic research to market





Energy Research Programs of the SFOE

Renewables ~8 MCHF

- Biomass and wood energy
- Geothermal energy
- Industrial use of solar energy
- Photovoltaic
- Solar heat and heat storage
- Hydropower
- Hydrogen
- Wind energy

Nuclear ~0,2 MCHF

- Fusion
- Fission and nuclear safety
- Radioactive waste
- Regulatory safety research

Energy efficiency ~9 MCHF

- Fuel cells
- Electricity technology and applications
- Energy in buildings
- Power plant 2020/CCS
- Grids
- Process engineering
- Transports
- Heat pumping technologies and refrigeration
- Combustion and CHP

P+D+L

~35 MCHF

- Pilot-, demonstrations- and light house projects

Weitere

~3 MCHF

- Energy–Economy–Society (EES)
- Dams (Safety)



Implementing Agreements IEA: participation of SFOE

Member in 20 out of 38 Implementing Agreements

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 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

International Smart Grid Action Network

Photovoltaic Power Systems

Solar Heating and Cooling Systems

Solar-PACES

Wind Energy Systems



18 weitere Implementing Agreements der IEA

Delegate

«Non nuclear» Implementing Agreements

Advanced Materials for Transportation

Climate Technology Initiative

District Heating and Cooling

Energy Storage

in discussion

Enhanced Oil Recovery

Fluidized Bed Conversion

Hydropower

Industrial Technologies and Systems

in discussion

Ocean

Renewables Deployment

Implementing Agreements tackling nuclear energy

Environment, Safety & Economy

Fusion Materials

CH: SBFI

Nuclear Technology Fusion Reactors

Plasma Wall Interaction

Reversed Field Pinches

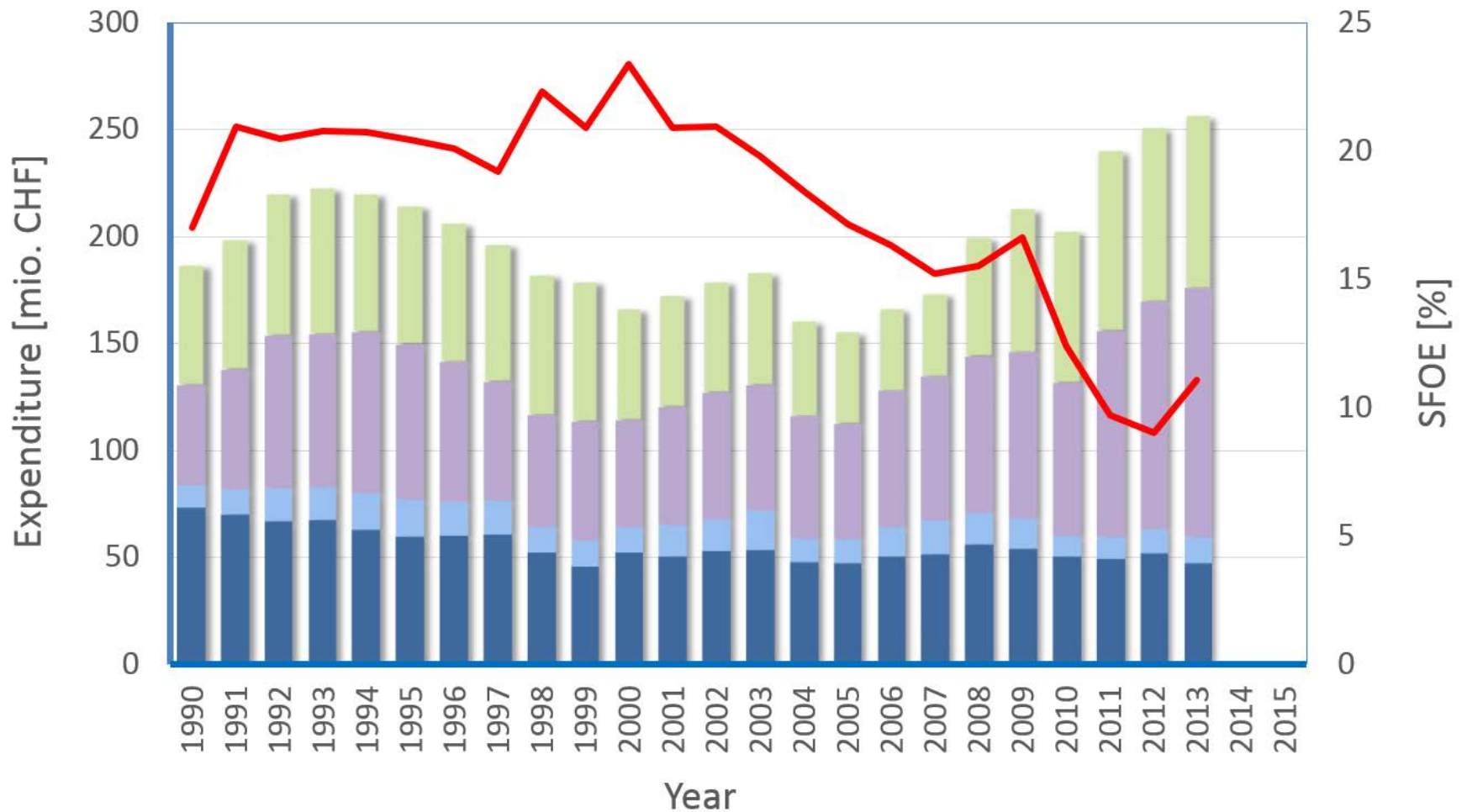
Spherical Tori

Stellarator-Heliotron

Tokamaks



Expenditure of Public Sector 1990 to 2013







Promoters of Energy Research

Public promotion

SFOE, FOEN, ENSI, Swisstopo, FOAG, others

CTI, SNSF, Technology fund, REPIC

ETH Domain, Universities, Universities of applied sciences

Cantons, Cities (e.g. ZH, GE, BS)

EC, EUREKA, COST

Market oriented promotion

e.g. SwissEnergy, ProKilowatt

Technology Fund

Private promotion

FOGA, FEV, Foundations

