



Business from technology

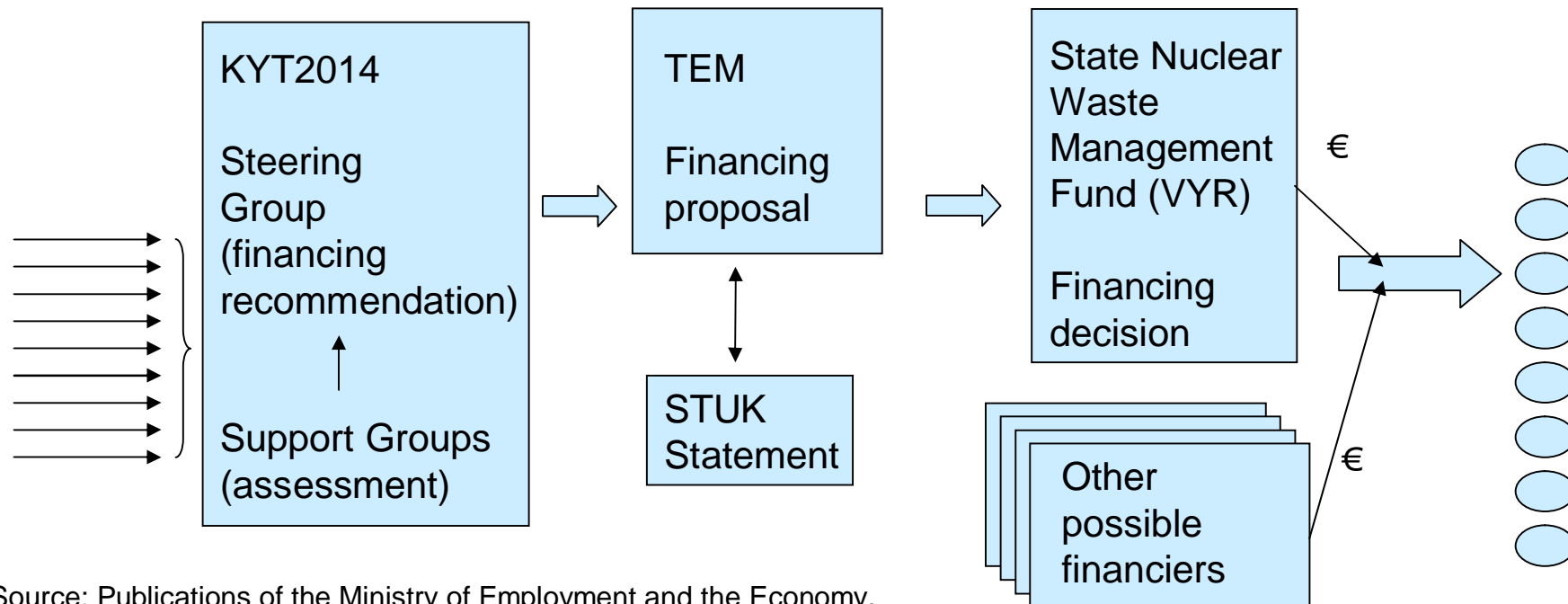
KYT2014 in 2012 – Steering Group recommendations

Kari Rasilainen

VTT Technical Research Centre of Finland

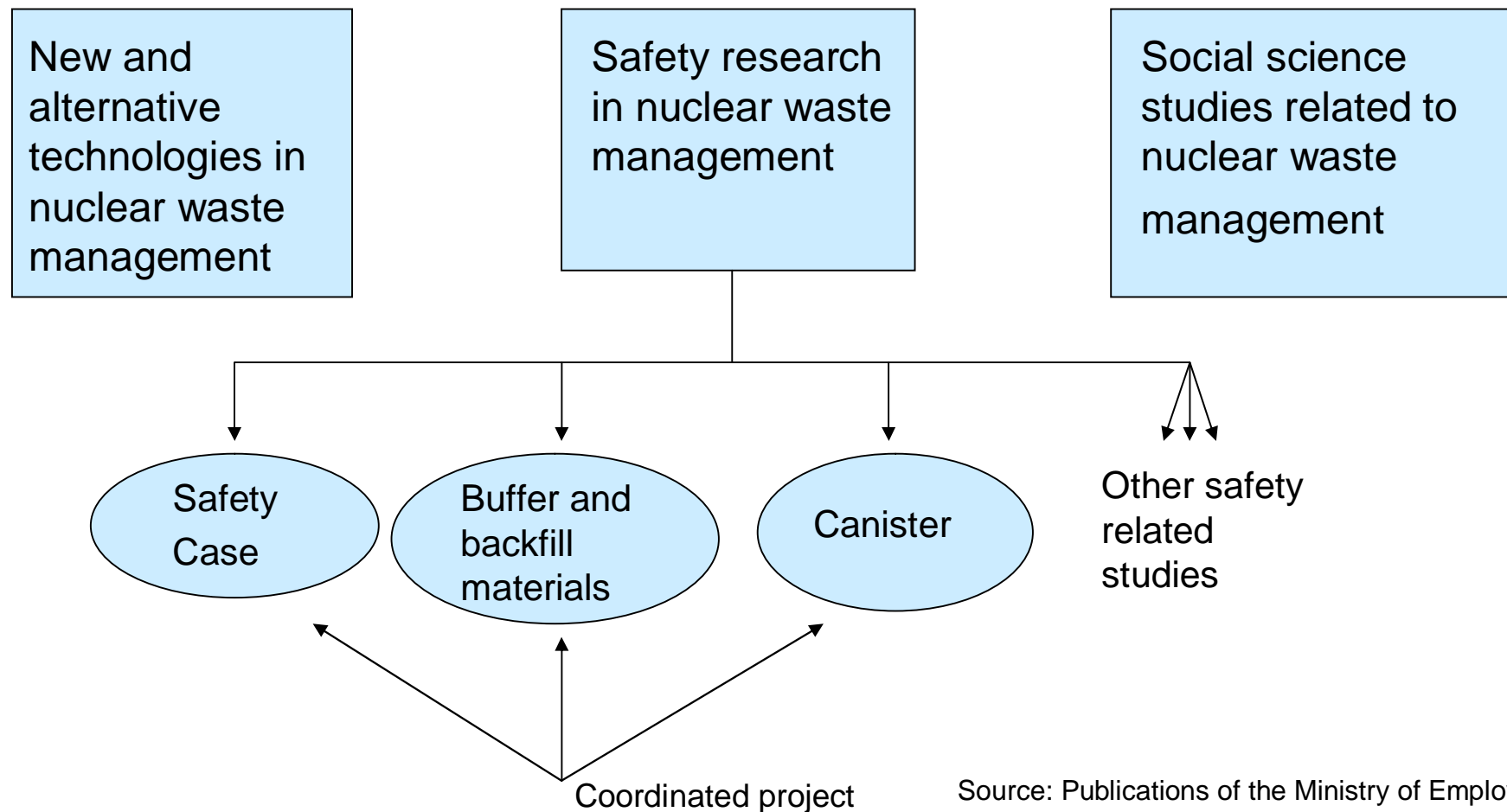
Decision making in KYT2014 about project proposals

Project proposals	Assessment	Financing proposal	Financing decision	Projects to be financed
(October)	(Nov.- Dec.)	(January)	(March)	



Source: Publications of the Ministry of Employment and the Economy. Energy and the Climate 72/2010

KYT2014 research topics



Source: Publications of the Ministry of Employment and the Economy. Energy and the Climate 72/2010

KYT2014 call for project proposals 2012

- Reduced funding for 31 research projects
 - Aalto (6), GTK (3), HY (6), JY (3), UEF (1), Ludus Mundi Oy (1), Numerola Oy (1), VTT (10)
 - 3 coordinated projects
 - Safety Case (LS-TUPER)
 - Buffer and backfill materials (BOA)
 - Canister (L-TICO)

New and alternative technologies in nuclear waste management, 3

Research project

Project manager

Advanced nuclear fuel cycles – new separation technologies

Risto Harjula, HYRL

Advanced Fuel Cycles – Computational Fuel Cycle Analysis

Tuomas Viitanen, VTT

Transmutation of nuclear waste in ADS (FLUTRA)

Rainer Salomaa, Aalto

Safety research in nuclear waste management Safety case (coordinated project LS-TUPER, project coordinator is presented in bold), 4

Research project	Project manager
Safety case for final disposal (LS-TUPER)	Markus Olin, VTT
Safety case for final disposal (LS-TUPER)	Juhani Suksi, HYRL
Complementary considerations of the safety case TUPER/GTK	Lasse Ahonen, GTK
Safety case for final disposal (LS-TUPER); computational model development	Antti Lempinen, Ludus Mundi Oy

Safety research in nuclear waste management Buffer and backfill materials (coordinated project **BOA, project coordinator is presented in bold**), 7

Research project	Project manager
Assessment of bentonite characteristics (BOA)	Markus Olin, VTT
Assessment of bentonite characteristics (BOA)	Antti Niemistö, Numerola Oy
Assessment of bentonite characteristics: mineralogical studies at GTK (BOA/GTK)	Mia Tiljander, GTK
Phenomenological THM modelling of bentonite (subproject of BOA consortium)	Markku Kataja, JYFL
Assessment of bentonite characteristics (BOA)	Ritva Serimaa, HYFL
The effect of colloids on radionuclide migration	Pirkko Hölttä, HYRL
The behaviour of bentonite and backfill block surfaces in shear stress	Leena Korkiala-Tanttu, Aalto

Safety research in nuclear waste management Canister (coordinated project L-TICO, project coordinator is presented in bold), 5

Research project	Project manager
Material Integrity of Welded Copper Overpack	Juhani Rantala, VTT
Mechanical properties of copper canister for nuclear waste	Hannu Hänninen, Aalto
Sulphide-induced embrittlement of CuOFP	Timo Saario, VTT
Corrosion monitoring under disposal vault conditions	Timo Saario, VTT
Corrosion of copper by water under oxygen free conditions	Antero Pehkonen, Aalto

Safety research in nuclear waste management

Other safety related studies, 11

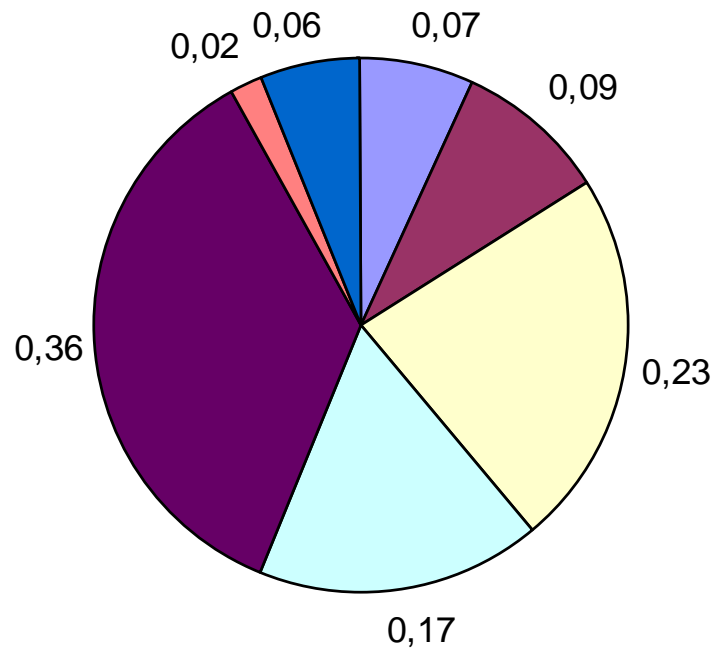
Research project	Project manager
In situ long term diffusion experiments	Marja Siitari-Kauppi, HYRL
Sorption of trivalent actinides onto clay and (hydr)oxide minerals	Tiina Huittinen, HYRL
Including heterogeneous rock structure in the modeling of matrix diffusion	Jussi Timonen, JYFL
Microbiological characterization of deep subsurface groundwaters (Geomicro)	Merja Itävaara, VTT
Saline fluids, gases and microbes in crystalline bedrock (SALAMI)	Ilmo Kukkonen, GTK
Deep bedrock bioinformatics (GEOBIOINFO)	Juho Rousu, Aalto
Durability of engineered concrete barriers under final disposal conditions (subproject 1)	Jari Puttonen, Aalto
Durability of engineered concrete barriers under final disposal conditions (subproject 2)	Eila Lehmus, VTT
Release of ¹⁴ C (Carbon-14)	Kaija Ollila, VTT
Use of empirical data to improve radioecological modelling applied to risk assessment of radioactive waste	Jukka Juutilainen, UEF
Risks of microbiologically influenced corrosion in the Finnish nuclear waste repository	Leena Carpén, VTT

Social science studies related to nuclear waste management, 1

Research project	Project manager
International Socio-Technical and Safety Challenges for Implementing Geological Disposal of Spent Nuclear Fuel - Finland and EU - FInSOTEC-2012-2014t	Tapio Litmanen, JY

KYT2014 call for project proposals 2012

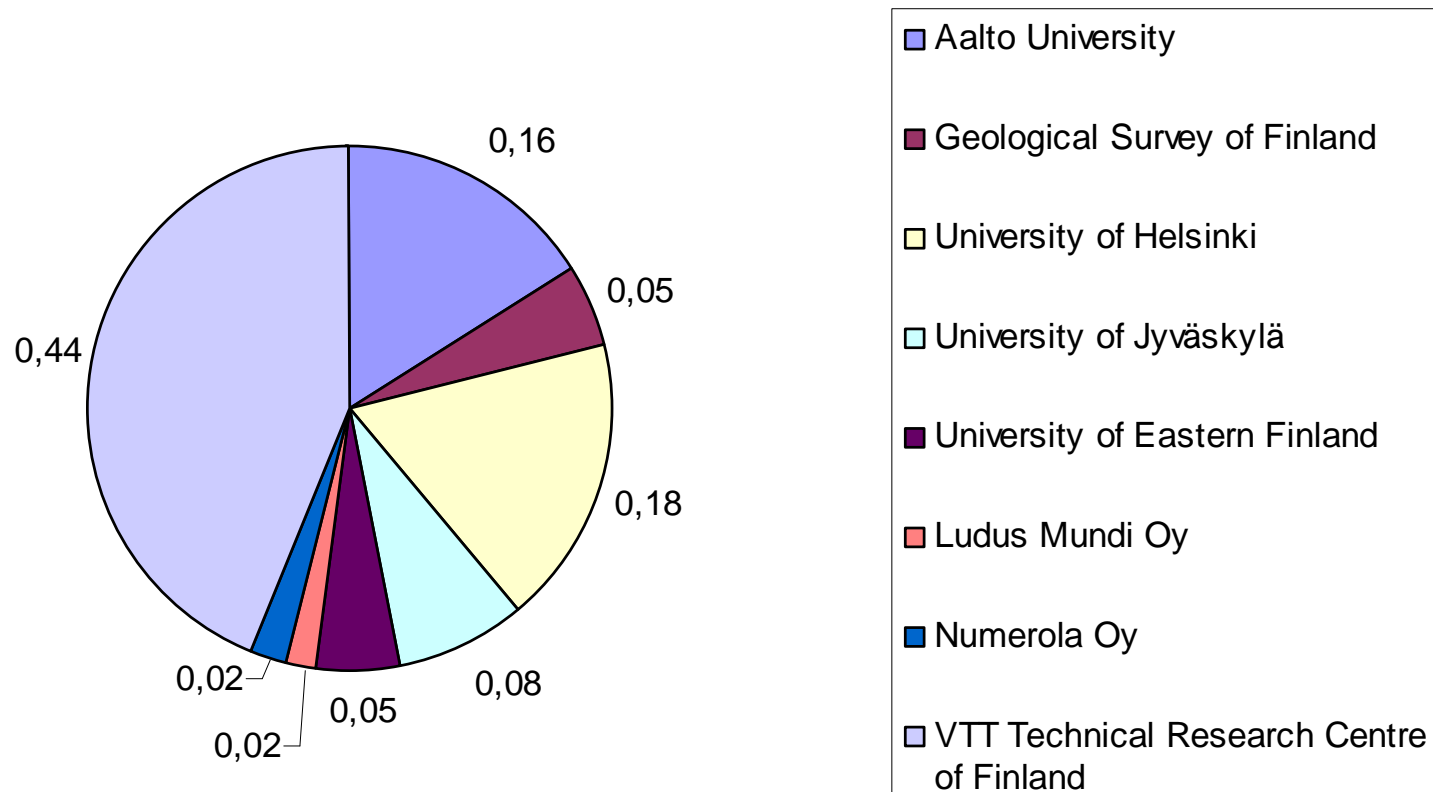
**KYT2014: Distribution of VYR funding 1 730 k€
between research topics in 2012**



- New and alternative technologies in nuclear waste management
- Safety research in nuclear waste management/safety case
- Safety research in nuclear waste management/buffer and backfill
- Safety research in nuclear waste management/canister
- Safety research in nuclear waste management/other safety related studies
- Social science studies related to nuclear waste management
- Administration

KYT2014 call for project proposals 2012

KYT2014: Distribution of VYR funding 1 730 k€ between research institutes in 2012



KYT2014 in 2012: basic numbers

- Total funding 2012 2,7 M€, VYR funding 1,7 M€
- Total volume 26,5 person-years (1 person year = 10,5 person months)
- More information at KYT2014 website (<http://kyt2014.vtt.fi/>)

KYT2014: Framework programme in general

- Nuclear Energy Act (990/1987), according to which the aim of research activity is *'ensuring that the authorities have such sufficient and comprehensive nuclear engineering expertise and other facilities at their disposal that are needed for comparisons of the various ways and methods of carrying out nuclear waste management'*
- "Programmes that directly involve the preparation or implementation of nuclear waste management, or the inspection of such activities by the authorities, are excluded from the KYT2014 research programme."

KYT2014: Framework programme and LS-TUPER 1

- A coordinated project has the aim of creating new experts in Finland, qualified in compiling and assessing safety cases. A further goal is to devise new methods of assessing the long-term safety of geological final disposal. Through hands-on work, the idea is to understand the philosophy (based on safety case scenarios), methods of acquiring and generalising information, the performance of practical analyses (based on different calculation models), and methods of assessing the reliability of results and the related uncertainties. For this purpose, work will begin on compiling a safety case for a final disposal solution, of the KBS-3 type, in crystalline bedrock^[1]. Because, during any single programme period, the resources of the KYT2014 programme are insufficient for producing all of the required information and assessment models, the safety case can be partly based on generally available models and information.

- ^[1] However, the KYT programme does not aim at preparing an entire safety case for the final disposal of spent fuel, since the licence applicant is responsible for preparing this.

KYT2014: Framework programme and LS-TUPER 2

- However, when preparing the work programme, repeating and copying previously compiled safety cases must be avoided. Instead, new ways must be found of approaching the issue and assessing models. Attention should be paid to the following:
 - The way in which scenarios are formed;
 - Alternative conceptual models and interpretations;
 - Development of uncertainty analysis methods;
 - New sources of information (work conducted outside nuclear waste management research and tangential to the safety analysis methodology), e.g. final disposal of carbon dioxide in the ground;
 - Development of safety case presentation methods, so as to make them as comprehensible to as wide an audience as possible (safety case principles, methods and restrictions).

New thing in 2012

- Steering Group wants to meet project managers

And finally ... to the point

- Second workshop in KYT2014
- We want to present our work at LS-TUPER
- We want to discuss the relevance of LS-TUPER work
 - Is the focus OK?
 - What is the ultimate aim?
 - Scientific collaboration with other research programs?
- We invite your views on safety case research