

Conceptual and Strategic Approaches to the Solution of Environmental- remediation Problems as Applied to Decommissioning of Facilities and Territories under the Jurisdiction of “TVEL” Public Corporation

**Ph. D. (Tech.) Valentin VYSOTSKY
Nuclear Safety Institutes RAS
Moscow**

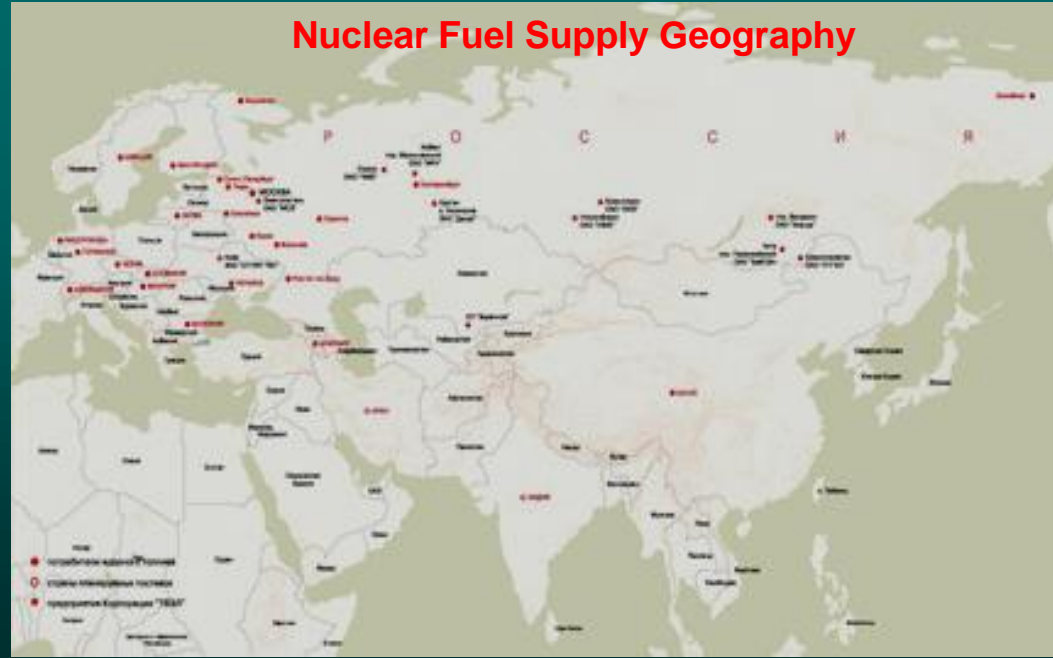
“TVEL” Public Corporation

is an integral part of “ROSATOM” State Corporation. The key activities of the company include the development, manufacturing and selling (including export) of nuclear fuel and the accompanying nuclear and non-nuclear products.

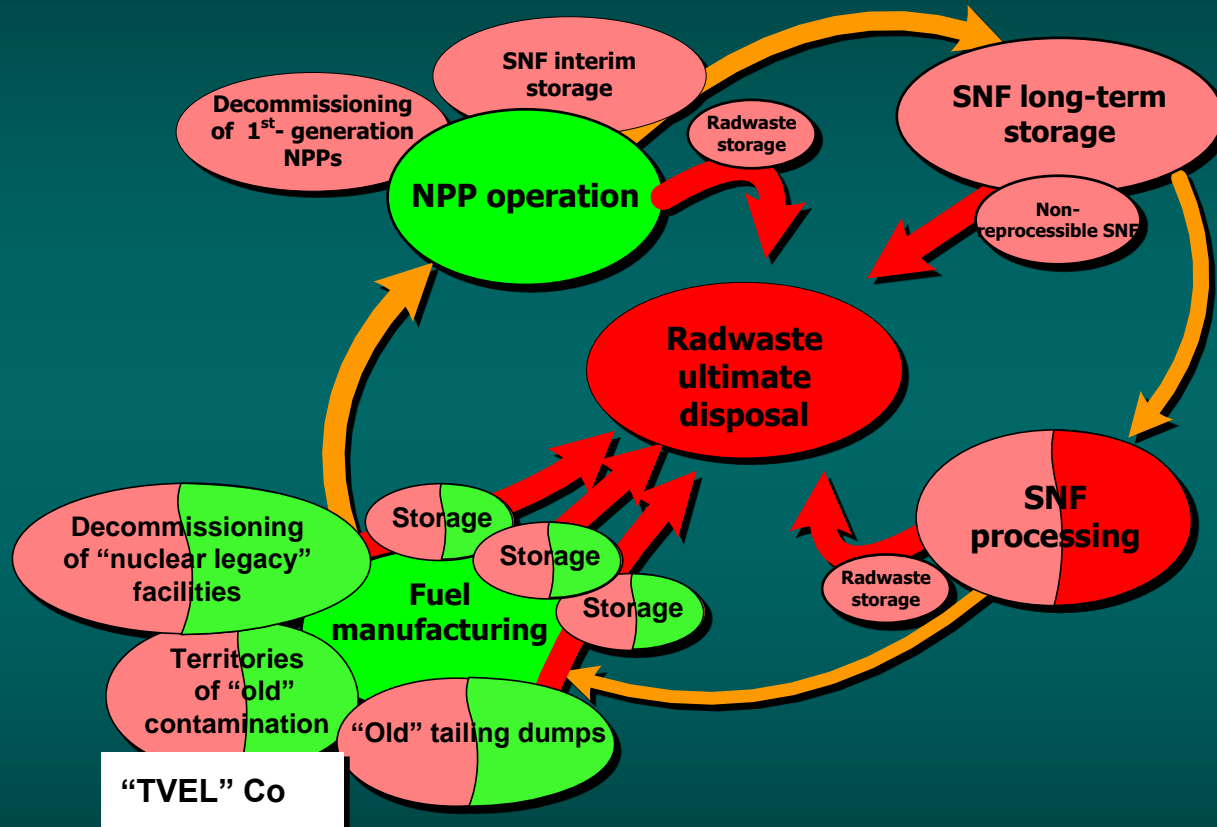
NUCLEAR PRODUCTS



Zirconium NON-NUCLEAR PRODUCTS



Problems of Nuclear, Radiation and Environmental Safety



- decisions, developments and construction required
- problems are available
- acceptable safety level

Actual Status of Environmental Problems 4

1. At present the use of modern technologies at enterprises does not produce large-scale contamination of facilities, individual buildings and territories any more.
2. The emphasis should be placed on remediation of environmental implications caused by technologies used in the 1950s-1970s (the “Nuclear Shield” development period).

Environmental Policy

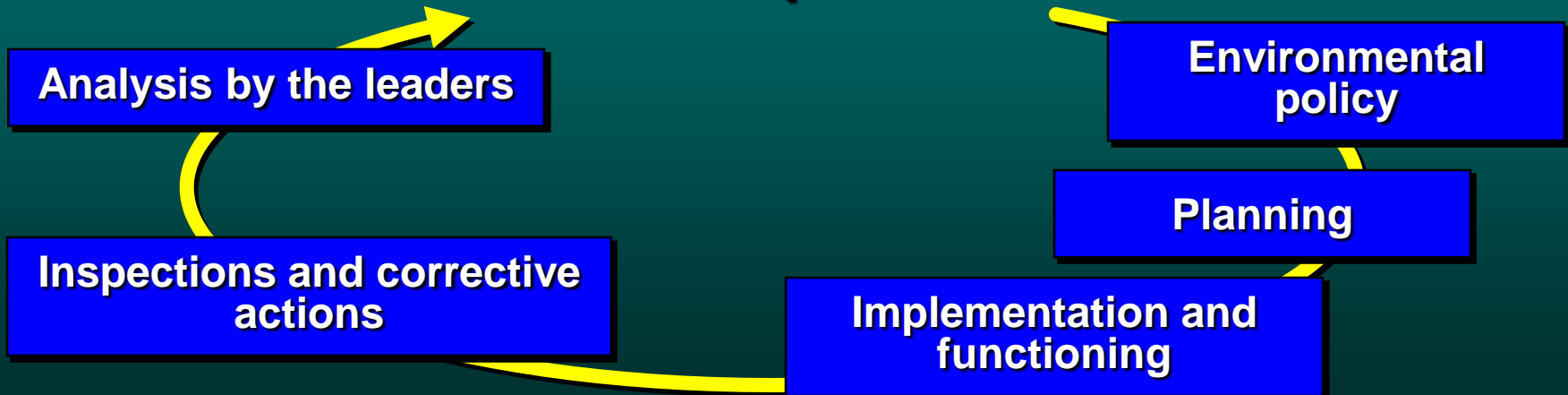
The key objective of the “TVEL” Co environmental policy consists in minimization of negative environmental effects via the reduction of releases of noxious substances and effluent waters and efficient use of energy resources.

The key enterprises of the company have been certified for the compliance of their environmental management system to the requirements of ISO 14001 International Standard by an independent auditor company (TUV Cert, Germany).

ISO 14001. A Standard of Environmental Management Systems

The algorithm: Planning – Execution – Control – Action

Permanent improvements



Decommissioning Objectives of “TVEL” Co

To date “TVEL” Co’s enterprises face the challenge of decommissioning their nuclear and radiation-hazardous facilities including environmental remediation of their sites in the cities/towns of: Elektrostal, Glazov, Novosibirsk, Tomsk, Angarsk etc. representing the “nuclear legacy” of the USSR’s defense nuclear programs of the last century.

A peculiarity - at present all such enterprises are situated within the boundaries of their cities/towns.

The goal of decommissioning of facilities do not intended for further use consists in solution of the following problems:

- transfer to a status requiring no supervision by the State regulatory bodies for nuclear, radiation and environmental safety; or
- transfer to the National radwaste-management operator.

The task is: to decommission, eliminate , or convert:

- several facilities, at least 100 buildings and constructions;
- dozens of storage facilities with different-type waste;
- secure millions of cubic meters of waste accumulated within tailing dumps; and
- restore/remediate several thousands hectares of lands.

This is a strategic-level problem

Strategic Pyramid



The Concept Goal

The formulation of key provisions on establishing an integrated system of stepwise decommissioning of facilities and remediation of their contaminated sites on the basis of existing enterprises.

The Eng Goal of Decommissioning and Environmental Remediation

1. Transfer of facilities to a state requiring no control by the State regulatory bodies for nuclear, radiation, chemical and environmental safety.
2. Remediation of contaminated territories up to specific levels defined in individual projects.
3. After preparative activities, transfer of radiation-hazardous facilities and waste destined for ultimate disposal to the National Operator.

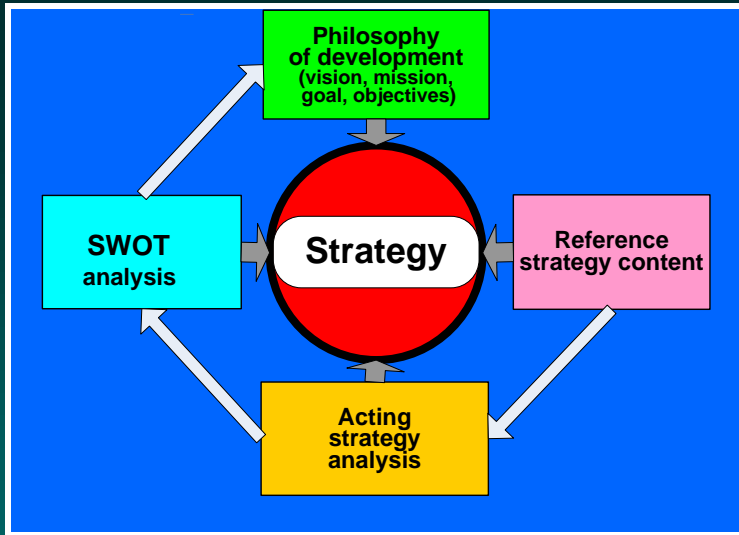
Implementation of the Concept

Stage I – 2011-2015

Objective – establish a system of decommissioning and remediation of radiation-hazardous facilities at “TVEL” Co and at its enterprises. Begin implementation of the top-priority activities and projects.

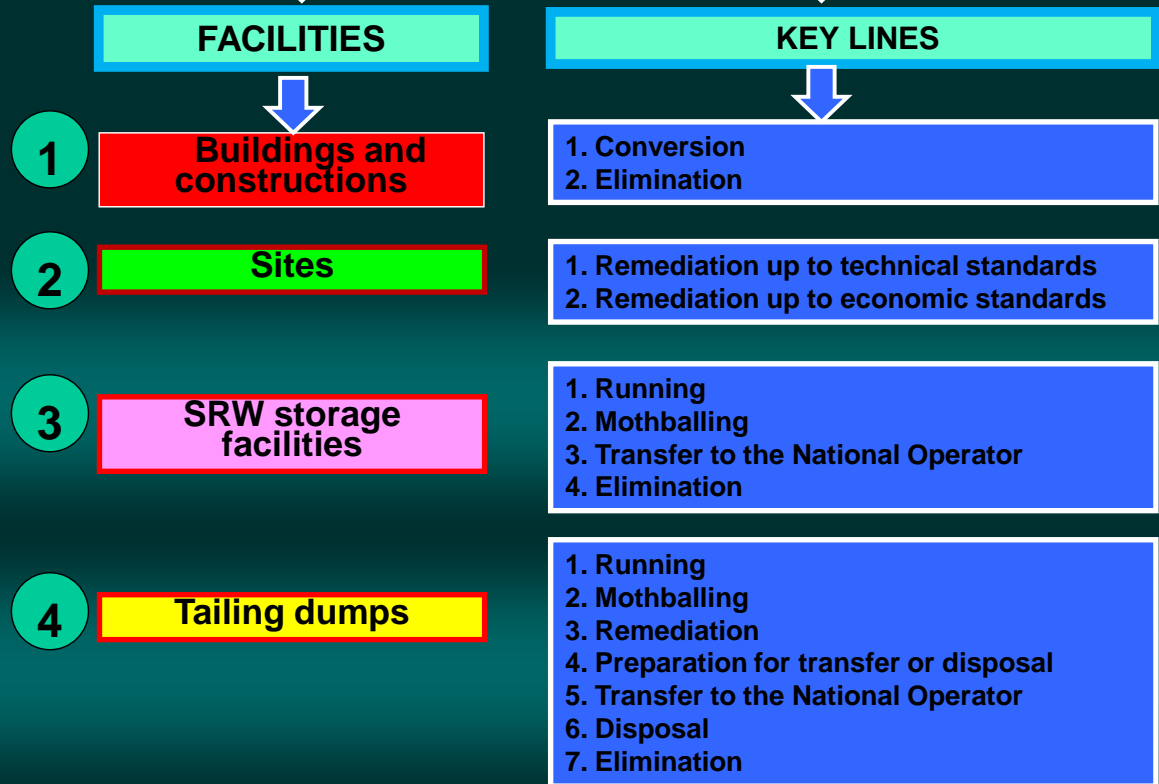
Stage II – 2016-2030

Objective – fully implement the intended activities and projects directed to decommissioning and environmental remediation of all decommissioned facilities in order to liberate the concerned enterprises from hazardous structures and unprofitable works.



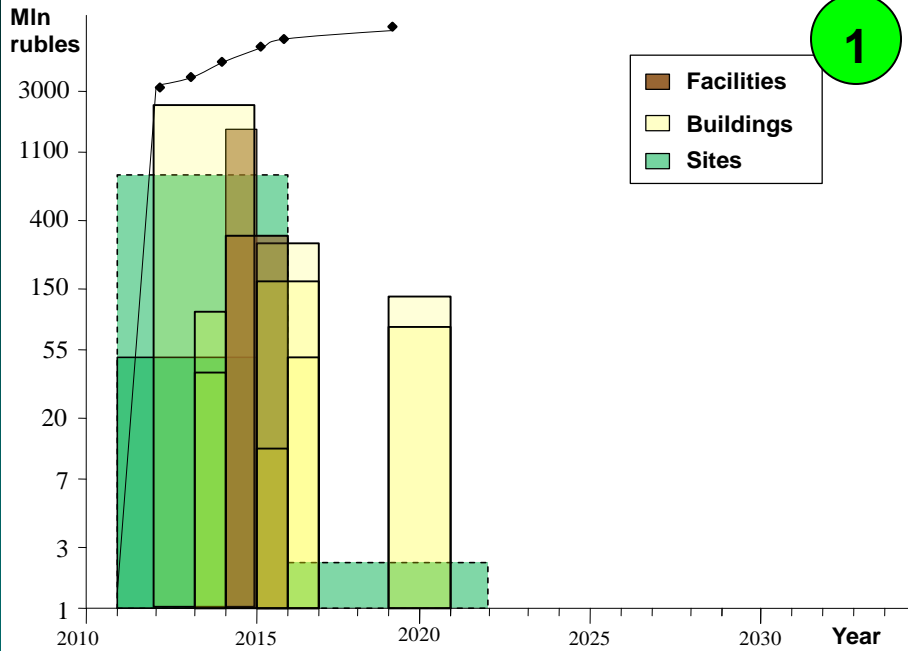
STRATEGY DEVELOPMENT OUTLINE

STRATEGIC VISION of Facilities to be Decommissioned and Remediation Sites

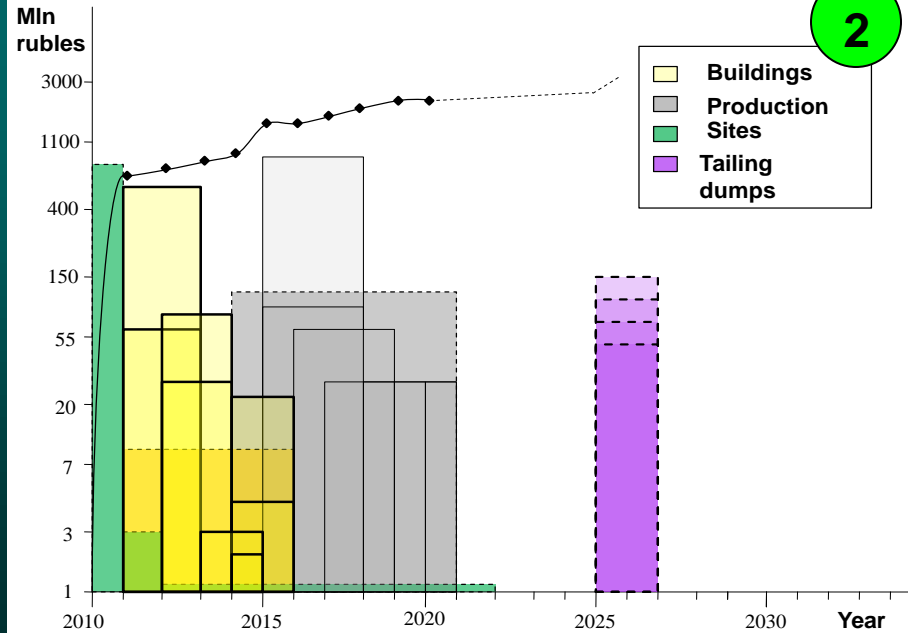


Dynamics of Decommissioning of Facilities and Remediation of Their Sites at Individual TVEL Company's Enterprises

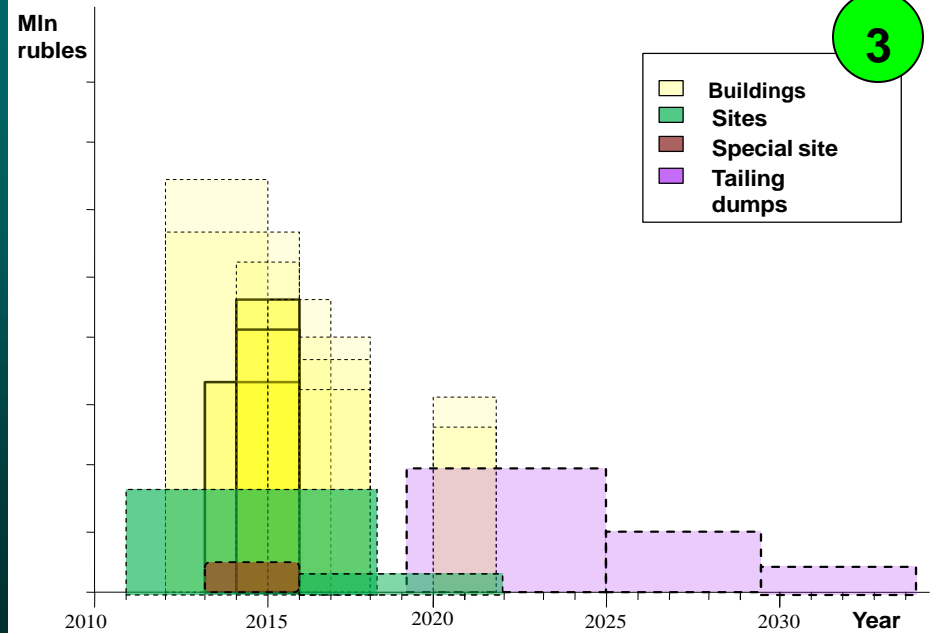
1



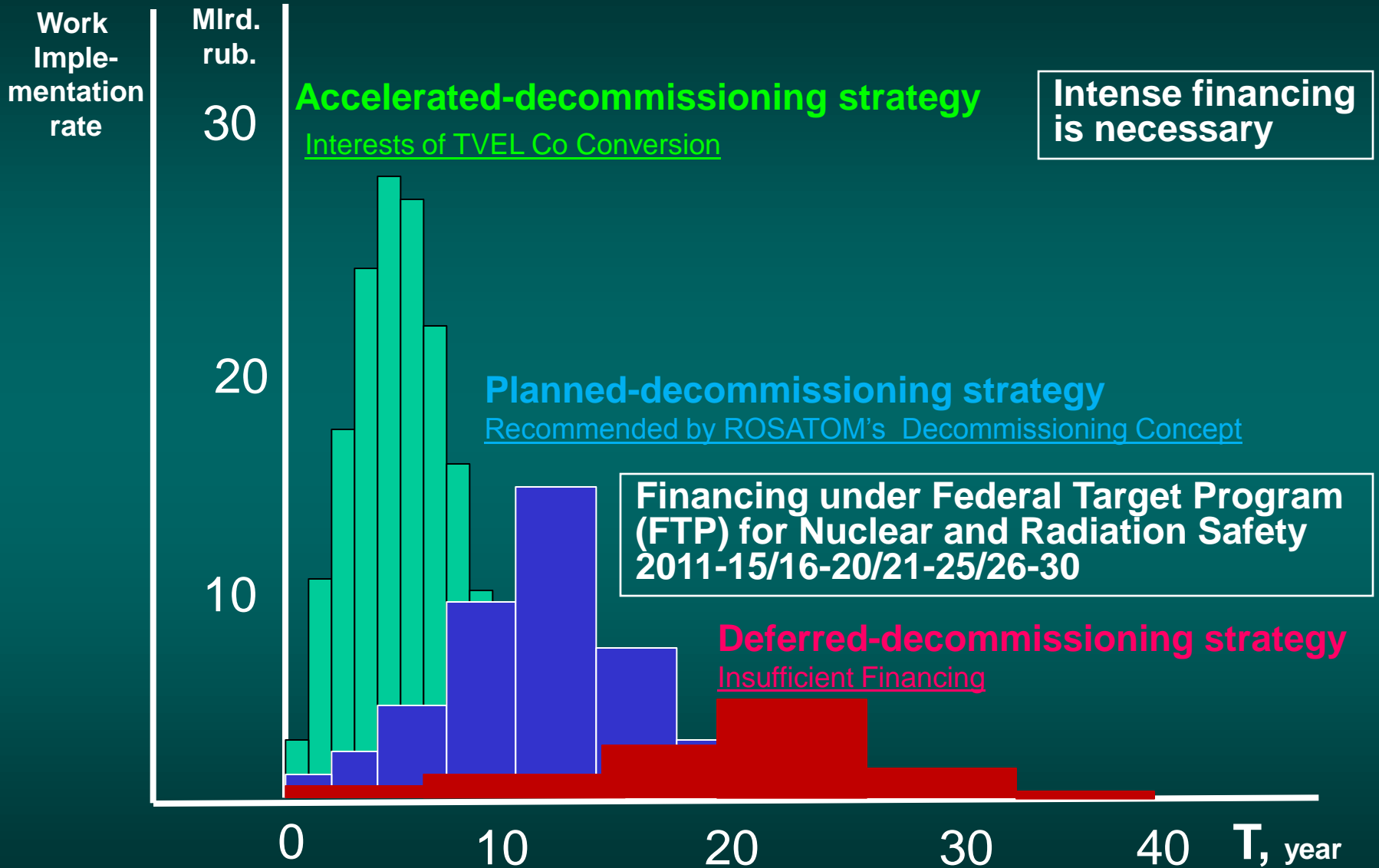
2



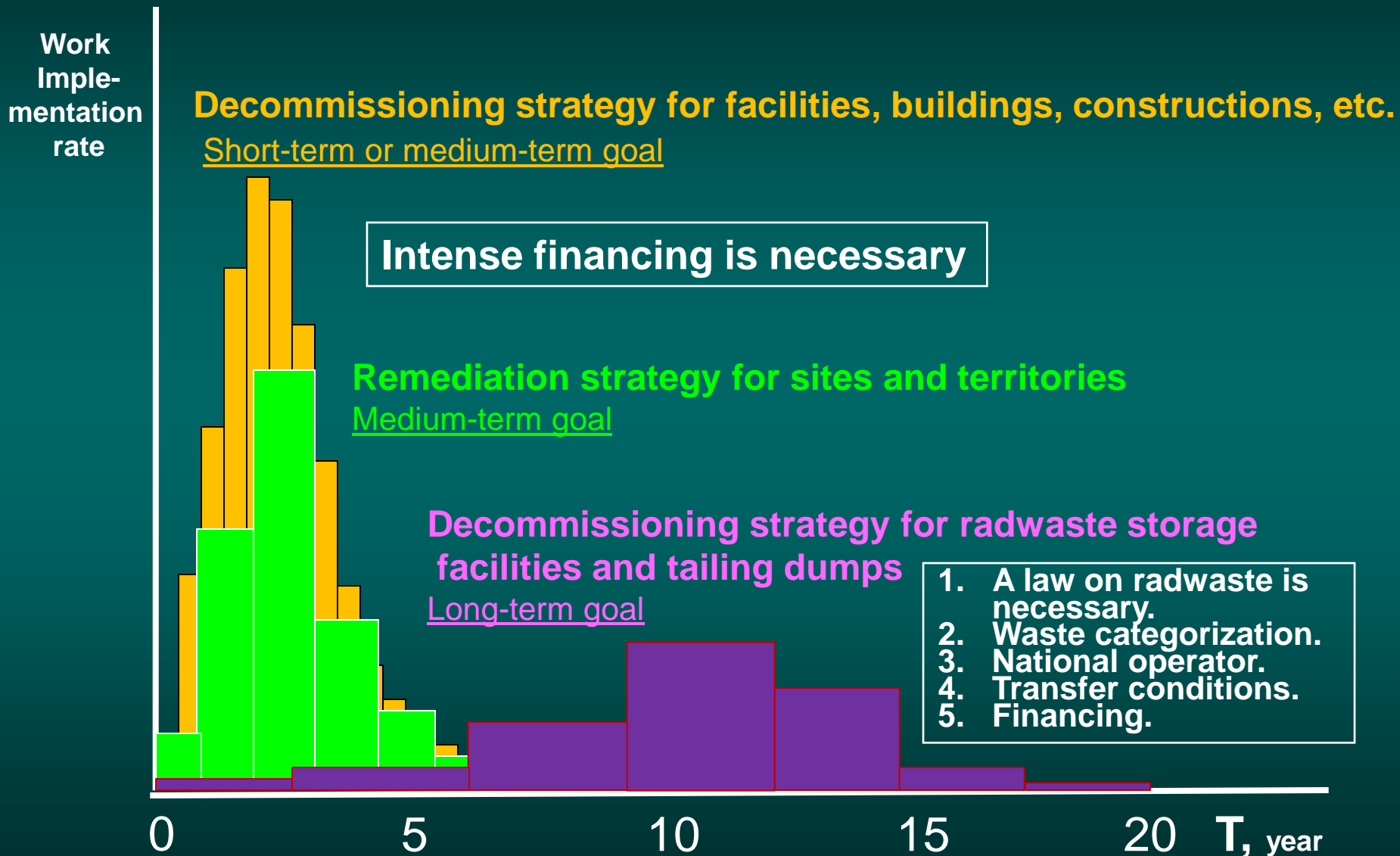
3



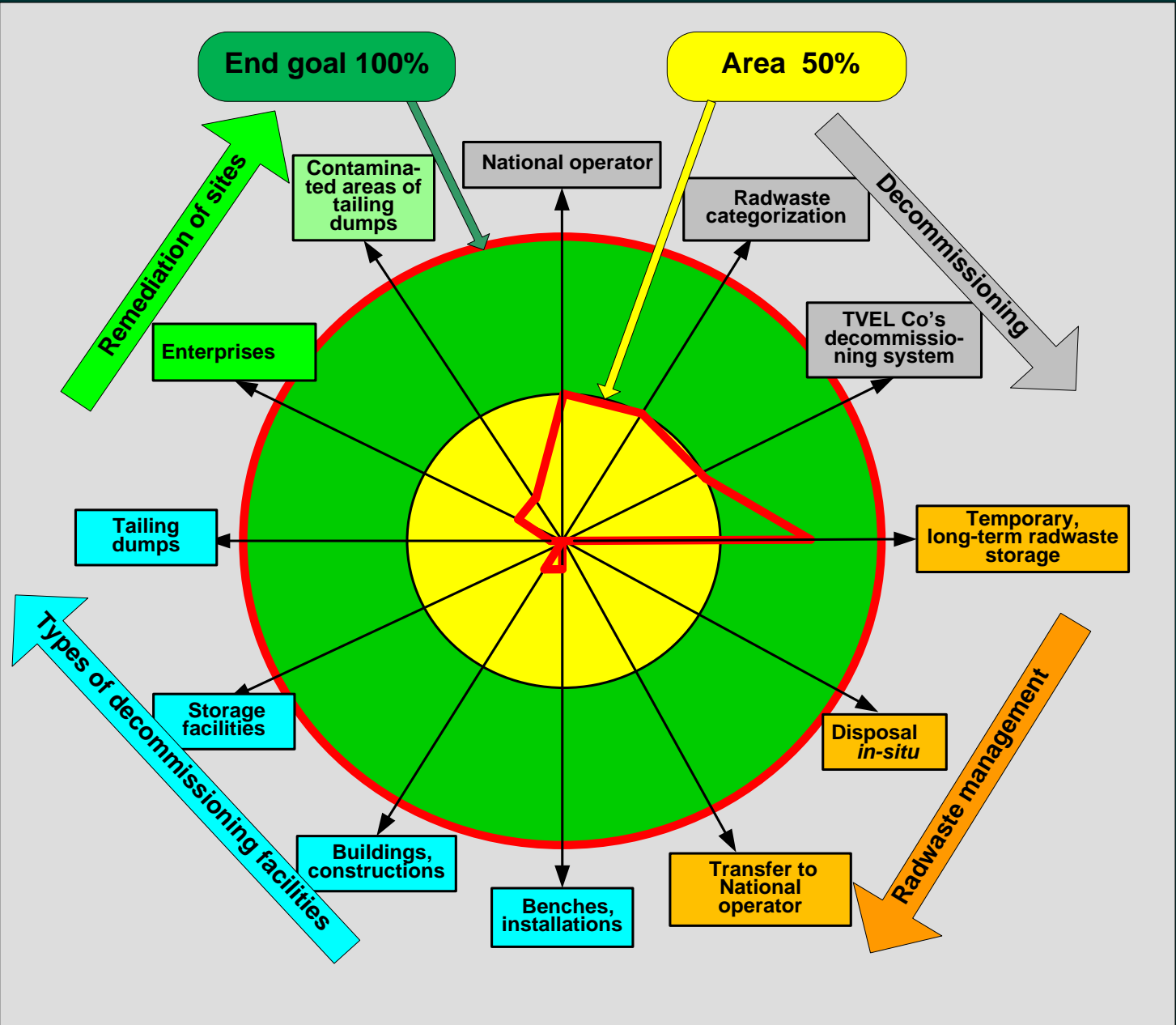
SELECTION OF A GENERAL STRATEGY



SELECTION OF TECHNOLOGICAL STRATEGIES



Generalized Strategic View for Decommissioning of TVEL's Facilities and Remediation of Their Sites



Status of a Facility before the Decommissioning

(an example of elimination of a radiation-hazardous facility and remediation of its site)



Dismantling of Buildings



Completion of Decommissioning of a Radiation-hazardous Facility

On June 29, 2010 a special commission of representatives of ROSATOM, the Krasnoyarsk Territory Government, the Russian Federal Medico-Biological Agency (FMBA), TOSTEKHNADZOR, "TVEL" Co, "KhMZ" Co, the developer and the contractor signed a "Facility Decommissioning Act".



On November 12, 2010 a decision was taken on lifting the regulatory supervision and the control over that former radiation-hazardous facility.

Prerequisites for Successful Development of the Program¹⁷

(implementation of the Strategy for decommissioning of radiation-hazardous facilities and environmental remediation of their sites)

1. The TVEL Co leaders have their own VISION and GOALS of development.
2. The responsibilities and positions of the Strategy developers and implementers are clearly distributed.
3. The 'Strategic Development' Service is directly subordinated to TVEL Co leaders, and interacts with an independent group of experts from IBRAE RAS on all issues of the Decommissioning Strategy development.
4. The outcomes of each Strategy-development stage are heard and amended, and appropriate decisions are made.
5. At each stage, the outcomes of strategic developments are debated at scientific-and-technical councils and videoconferences.
6. The selected Strategic alternative and the Program developed on its basis will be accepted as a guide to action.
7. Individual lines of the Strategy to be implemented include rather tough though realistic tasks. The goal-achievement process will be broken into intermediate sub-goals and time sub-stages.
8. The Strategy development-and-amendment process provides for distinguishing its 'inalterable' and 'flexible' elements enabling prevention of full revision of the Strategy.
9. The Program implementation will be monitored using the so-called 'control points'.

Thank You for Your Attention !