RIFF

Research Infrastructures for the Future of Ukraine

EU RI Roadmapping Experience

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Funded by the European Union

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P1 – Why national RI Roadmaps matter
The EU RI Ecosystem

📊 31 countries engaged in RI roadmapping
✅ 24 countries (77%) with active national roadmaps
EU 63 ESFRI RIs (41 Landmarks + 22 Projects)
💰 €25 billion pan-European investment agenda
🌍 Multiple global partnerships and collaborations

REGIONAL / INSTITUTIONAL Level

Universities, research institutions, regional RIs
Institutional RI strategies and priorities
- Direct service delivery to researchers
- Example: University research centers, regional Smart Specialisation Strategies (RIS3)

NATIONAL Level

National RI Roadmaps (24 active in EU/Associated Countries)
National funding agencies and ministries
Strategic priorities aligned with national R&I goals
- Example: Czech Roadmap (43 RIs), Portuguese Roadmap (56 RIs)

European (ESFRI) Level

ESFRI Roadmap coordination
41 Landmarks + 22 Projects = €25B investment agenda
European Research Infrastructure Consortia (ERICs)
- Example: CERIC-ERIC, ECRIN-ERIC, European Spallation Source

GLOBAL Level

International partnerships and collaborations
Science diplomacy and global research challenges
- Example: CERN, ESO, SKA Observatory

P1 – Why national RI Roadmaps matter
The EU RI Ecosystem

✓ Bottom-up needs identification flows from researchers → institutions → national → European → global
✓ Top-down strategic coordination flows from global priorities → European strategy → national implementation → institutional delivery
✓ National roadmaps are the critical link between institutional capabilities and pan-European strategy
✓ Subsidiarity principle respected: diversity within coordination framework

> "National roadmaps are not only important for individual countries' RI systems, but are also essential for the long-term sustainability of pan-European RIs. National RI roadmaps contribute to justifying long-term funding commitments effectively and efficiently."
>
> — InRoad Final Report, 2018

P1 – Why national RI Roadmaps matter

78% of participating countries use roadmaps as input for funding decisions; 67% list strategic priorities for foreseen funding

1. STRATEGIC GUIDANCE & LONG-TERM PLANNING

- **Long-term investment planning (10-20 year horizon)**
- Provides direction for research communities about what will be available
- Creates predictability for resource allocation in constrained budgets
- Enables research communities and institutions to plan strategically
- **Alignment with national R&I priorities**
- Links RIs to broader national research and innovation strategies
- Connects to national reform plans and policy objectives
- Supports European Research Area (ERA) goals and European strategy

2. TRANSPARENCY & ACCOUNTABILITY

- **Clear, transparent decision-making processes**
- Published criteria and evaluation methodologies that all stakeholders understand
- Open calls for proposals that allow any qualified institution to participate
- Independent expert review providing objectivity
- Public accountability for public investments
- **Justification of public funding allocation**
- Provides evidence-based rationale for major investments
- Builds trust with taxpayers, researchers, policymakers, and society
- Demonstrates that RI investments are merit-based and strategically sound
- Increases legitimacy of funding decisions

P1 – Why national RI Roadmaps matter

68% of Portuguese RIs aligned with ESFRI Roadmap or international initiatives; evaluation explicitly linked to RIS3 strategic alignment; combined EU Structural Funds + national funding

3. COORDINATION & INTEGRATION

- **National-European level alignment**
- National roadmaps feed into ESFRI Roadmap development (every 4-5 years)
- Enables participation in pan-European RIs and ERIC consortia
- Facilitates access to Horizon Europe funding for operations and upgrades
- Demonstrates national commitment (typically required by ESFRI)
- **Regional integration**
- Connection with Regional Smart Specialisation Strategies (RIS3)
- Links to European Structural Investment Funds (ESIF) for financing
- Coordinates multiple governance levels (municipal, regional, national, European)
- Maximizes synergies between different funding sources

4. RESOURCE OPTIMIZATION & GAP IDENTIFICATION

- **Avoiding duplication**
- Systematically identifies complementarities between national and international RIs
- Prevents redundant investments that waste resources
- Achieves synergies through strategic positioning and clustering
- Enables sharing of expertise and resources where beneficial
- **Identifying scientific needs and gaps**
- Landscape analysis reveals strengths and weaknesses in national RI ecosystem
- Helps scientific community identify missing capabilities
- Guides targeted new investments where they add most value
- Supports prioritization when budgets are limited

P1 – Why national RI Roadmaps matter

5. LONG-TERM SUSTAINABILITY

- **Lifecycle management planning**

- Addresses entire RI lifecycle: concept > design > preparation > implementation > operation > termination

- Realistic planning for operational costs (typically 10-20% of capital annually)

- Transition planning between lifecycle phases

- Decommissioning and successor planning

- **Financial sustainability**

- Identifies funding sources throughout entire RI lifecycle, not just construction

- Plans for transition from construction to operations funding

- Connects to multi-year budgeting and funding frameworks

- Ensures long-term commitment from host institutions and national/European funders

Funding from different sources (regional, national, European) along different RI lifecycle stages, particularly for operation and termination is not guaranteed within existing funding frameworks. National roadmaps must plan for entire lifecycle to ensure long-term sustainability.

Netherlands: Requires 10-year budget for full RI costs; host institutions commit to paying 50% of operational costs for 10 years; NWO funds other 50%; creates predictability and shared responsibility.

P2 - ESFRI Roadmap – the gold standard

ESFRI Roadmap History:

- **1st Roadmap** (2006): 48 projects, first European-level coordination

- **2nd Roadmap** (2008, 2010): Updated with evolving landscape

- **Current Phase** (2016-2026): Mature methodology with lifecycle thinking and Landmarks

Key Lesson for Ukraine: Roadmapping processes evolve and mature. ESFRI's journey from 2006 to 2026 shows increasing sophistication, but also that you don't need perfection on Day 1. Start with clear principles, and refine methodology as you learn.

Cycle 1 (2006-2010): Incubation & Initial Coordination

First European-level roadmap compilation
Lists of opportunities for pan-European research
Discovery of the need for common evaluation framework
Limited criteria for prioritization
Learning period for countries and institutions

Cycle 2 (2010-2016): Professionalization & Lifecycle Integration

Lifecycle concept introduced: 6-phase approach from concept to termination
10-year rule implemented: Projects must reach Implementation Phase within 10 years
Minimal Key Requirements (MKRs) defined: Clear standards for each lifecycle phase
Landmarks introduced: Recognition of operational facilities distinct from Projects
Dual evaluation system: Scientific Case + Implementation Case evaluated separately
Financial requirements strengthened: 2 Member States with binding commitments required

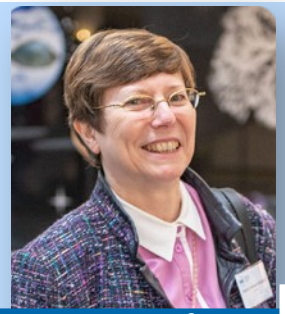
Cycle 3 (2016-2024): Portfolio Management & Ecosystem Thinking

Portfolio approach: ESFRI Roadmap viewed as coherent portfolio, not just collection of projects
Landscape analysis introduced: Assessment of gaps and strengths in European RI ecosystem
Environmental considerations: Sustainability and environmental impact first systematically addressed
Monitoring institutionalized: Regular assessment of Projects and Landmarks against progress
e-Infrastructure & Data integrated: Recognition that digital infrastructure is essential across all domains

Cycle 4 (2024-2026): Decoupling, Sustainability & Resilience

Decoupled process: Landscape Analysis (2024) separated from Roadmap (2026) allows time for reflection
Environmental sustainability**: Mandatory dimension with action plans and KPIs
Ecosystem resilience: Focus on robustness and flexibility of European RI system
Digital evolution: AI, advanced data management, cybersecurity integrated
Research security: New dimension addressing geopolitical challenges
Global cooperation: Emphasis on open science while protecting strategic interests

ESFRI (Roadmapping) concept evolution

2002	2006	2008	2010	2016
				
Hans Chang	**John Wood**	**Carlo Rizzuto**	**Beatrix Vierkorn-Rudolph**	**John Womersley**
ESFRI Concept ESFRI established with a mandate from the Council of the EU	**1st ROADMAP** for the construction and development of the next generation of pan-Eur RIs 	**1st UPDATE** Increasing the number of RIs of pan-Euro releva 	**2nd UPDATE** focusing on Energy, Food and Bi 	**Update process** identified projects expected to move to **implementation (LM)** in <10 years from their first inclusion on the Roadmap.

Startegic policy advice to Council of ministers, RIs Roadmaps, RI Landscapes, ESFRI scripta and Publications

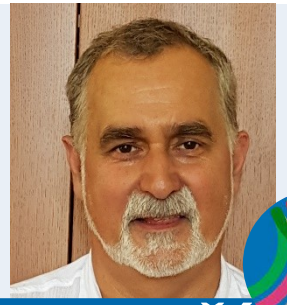
ESFRI (Roadmapping) concept evolution

2016 - 2018

Giorgio Rossi

Consolidation & incorporation of the mandates of Council: **sustainability**, innovation, and hub of funders of e-infra

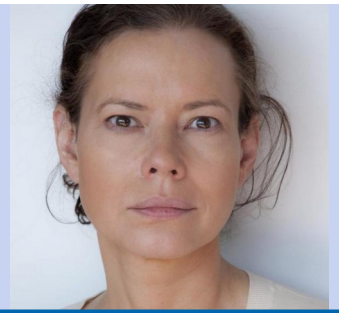
2018 - 2021



Jan Hrušák

Integration &relevance **strategic positioning** in ERA; paradigm shift from planning to operation, joint ESFRI vision - the ESFRI White Paper

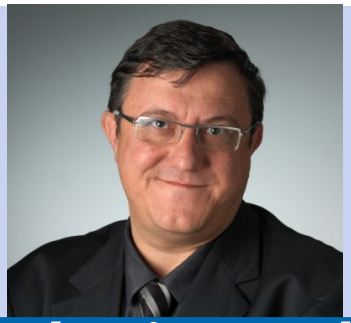
2022 - 2023



Jana Kolar

Integration of RIs in the renewed ERA, **Landscape Analysis** in 2023, increasing cooperation with industry and technological infrastructures

2024



José Luis Martínez Peña

Global perspective integration &implementation of **strategic positioning** in ERA; **new ESFRI Roadmap to be presented in 2025/2026**

RM 2021: RIs (22 projects and 41 landmarks) next RM 2025 / 26

ESFRI Lifecycle approach – six reference phases

Phase 1: CONCEPT (Early Stage)

- Purpose: Screening of concept feasibility, consortium formation

- Typical Duration: 1-3 years

Phase 2: DESIGN (Preparation for Design Study)

- Purpose: Feasibility studies, business case development, political support mobilization

- Typical Duration: 2-5 years (often through EU-funded design study)

Phase 3: PREPARATION (Legal Entity & Business Planning)

- Purpose: Establish legal entity, finalize business plan, secure political/financial commitments

- Typical Duration: 3-8 years (often through EU

Phase 4: IMPLEMENTATION (Construction & Deployment)

- Purpose: Construct facilities, deploy organization, recruit personnel, establish operations

- Typical Duration: 5-15 years (can be longer for mega-facilities)

Phase 5: OPERATION (Service Delivery & Continuous Evolution)

- Purpose: Deliver research services, support frontier research, continuous improvement

- Typical Duration: 15+ years (potentially indefinite, with upgrades)

Phase 6: TERMINATION (End of Life Management)

- Purpose: Planned phase-out, decommissioning, site restoration, knowledge preservation

Key principles of the ESFRI lifecycle

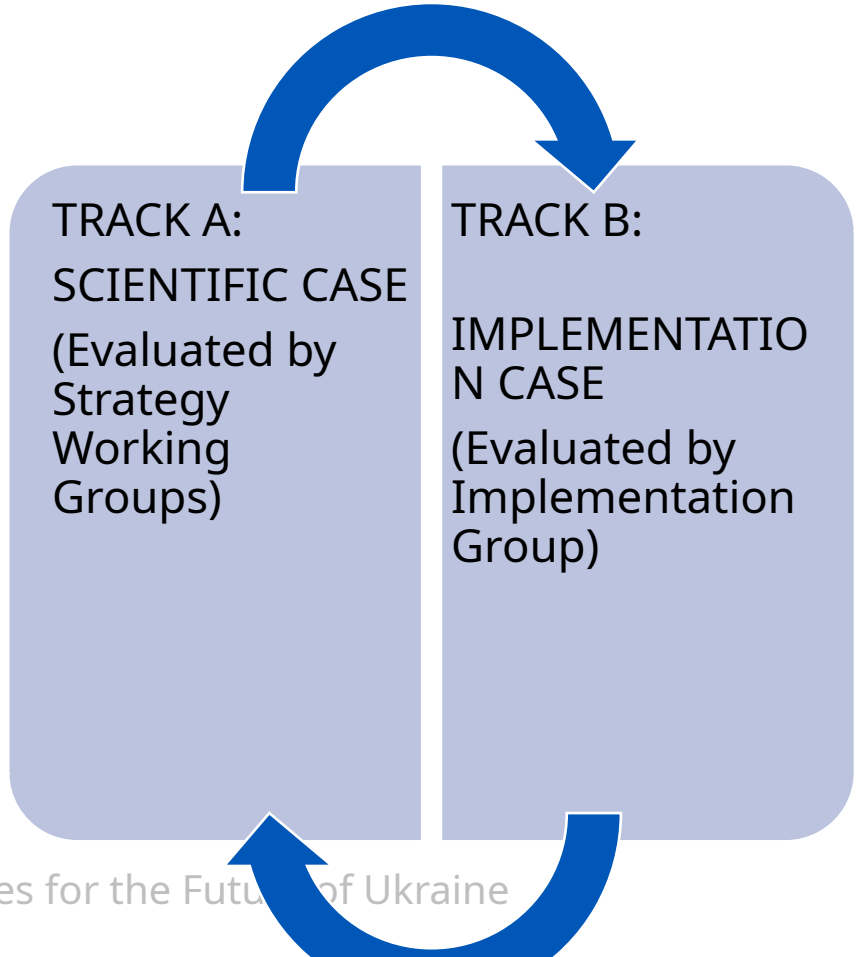
1. **Clarity at Each Phase**: MKRs defined for each phase allow stakeholders to know exactly what's needed to progress
2. **Flexibility**: Not all phases are mandatory for all RIs; some may skip phases if already partially developed
3. **10-Year Implementation Rule**: Projects must reach Implementation Phase within 10 years or come off roadmap (ensures active progress, not indefinite planning)
4. **Financial Planning Throughout**: Each phase requires financial commitments and projections; no assumed automatic funding
5. **Stakeholder Commitment Verification**: Particularly in Preparation and Implementation phases, requires documented commitments from Member States/Associated Countries
6. **Exit Criteria**: Clear understanding of when RI qualifies for next status (Project to Landmark)
7. **Environmental Integration**: At all phases, environmental considerations addressed (new requirement in 2026 Roadmap)

For Ukraine, this lifecycle approach should be central to your roadmap. It prevents both problems: the problem of over-committing to immature ideas, and the problem of under-funding good ideas in early phases. It's a balanced approach based on 20 years of European experience.

ESFRI Dual Evaluation System – Scientific case & Implementation Case

Six Dimensions of Scientific Excellence:

1. Scientific Excellence (40-60% weight in scoring)
2. Pan-European Relevance
3. Socio-Economic Impact
4. User Strategy & Access Policy
5. e-Infrastructure Needs & Data
6. Environmental Considerations



Five Dimensions of Feasibility:

1. Stakeholder Commitment (Most Critical)
2. Preparatory Work & Planning
3. Governance, Management & Human Resources
4. Financial Sustainability
5. Risk Assessment & Mitigation

P3: National Roadmapping – Common and divergent Elements Across European National Roadmaps

All have:

a) Open Calls for Proposals

b) Prioritization Based on Evaluation

c) Scientific Peer-Review Evaluation

d) Monitoring of Projects and RIs

e) Support from Independent National and International Experts

Variation / differences:

| **Frequency of open calls** | Annual (Austria) to once per decade (Spain) |

| **Composition of evaluation panels** | National-only (limited cases) to international-heavy (Czech, Portugal, Norway) |

| **Criteria weighting** | Science 40-60%; Feasibility 20-40%; Strategic value 20-30% |

| **Linkage to funding** | Automatic funding (24 countries) vs. input to decision (59 countries) |

| **Number of RIs on roadmap** | 12 large ones (Germany) to 70 across scales (Poland) |

| **Update cycle** | Every 2 years (Norway) to 8+ years (Austria, Spain) |

| **Connection to smart specialization** | Explicit (Portugal, some others) to implicit (most)

P3: National Roadmapping – Best practices

Despite diversity, nearly all national roadmaps include:

1. **Landscape analysis**: Survey of existing RIs, needs assessment, gap identification
2. **Strategic priorities**: Identification of high-priority research areas
3. **Evaluation framework**: Criteria for assessing proposals
4. **Prioritization mechanism**: Method for ranking and selecting RIs
5. **Monitoring elements**: System for tracking progress
6. **Stakeholder engagement**: Consultation with scientific community, institutions, governments

Different elements work together as a system:

1. Landscape analysis reveals what exists and what's missing
2. Strategic priorities identify where investment matters most
3. Evaluation framework assesses proposals against clear standards
4. Prioritization mechanism ranks RIs and determines selection
5. Integration embeds roadmap into broader R&I system
6. Funding connection ensures priorities translate to budgets
7. Community engagement ensures process reflects real needs

A weak link in this chain undermines the whole system. Strong roadmaps have all elements functioning well.

P3: How countries organize roadmaps

MODEL A: MINISTRY ALONE

MODEL B: AGENCY ALONE

MODEL C: MINISTRY + AGENCY PARTNERSHIP

MODEL D: MINISTRY + AGENCY + REGIONAL AUTHORITIES (Multi-Level Governance)

Why Model C Dominates in Europe:

The **Ministry + Agency partnership** model is most common in European countries because:

1. **Balances scientific quality and strategic alignment**: Ministry ensures strategy; agency ensures excellence

2. **Democratic accountability**: Ministers answer to government and public; scientists have voice through agency

3. **Insulation from pure politics**: Agency provides buffer; process rigor protects against arbitrary decisions

4. **Manageable complexity**: More than Model A/B; less than Model D

5. **Proven effectiveness**: ESFRI has observed this model works well across diverse national contexts

6. **European alignment**: Compatible with European structural funds and Horizon Europe processes

National Roadmap Maturity Levels - Where Europe Is Today

- **24 countries (77%)** have active, published national roadmaps
- **4 countries (13%)** have roadmaps under development
- **3 countries (10%)** do not have formal roadmaps
- **Average update frequency**: 4-6 years (range: 2 to 8+ years)
- **Total number of RIs on active roadmaps**: ~1,100+ (approximate)

Metric	Result (2025)
Countries analyzed	31
With active, published roadmaps	**24 (77%)**
Under development	**4 (13%)**
Without roadmap	**3 (10%)**
Avg. update frequency	**4–6 years** (range 2–8+)
Total RIs on active roadmaps	**~1,100+**

Europe's RI roadmap landscape is diverse but converging on structured, transparent, and ESFRI-aligned models.

Ukraine's opportunity: position as a **Central–Eastern European integrator**, combining rigor (CZ), EU alignment (PT), and open competition (NO).

P3: National Roadmap Maturity Levels - Where Europe Is Today

Category	Description	Examples	Key Features
PIONEERS / Highly Mature	≥5 editions; institutionalized process	CZ Czech Rep., FR France, NL Netherlands, SE Sweden	Frequent updates; peer review; integrated planning
ESTABLISHED SYSTEMS	2–4 editions; regular cycles	DK Denmark, FI Finland, DE Germany, NO Norway, PT Portugal	Governance via ministries/agencies; alignment with strategy
EMERGING PROGRAMS	1–2 editions; early-stage systems	PL Poland, HU Hungary, SI Slovenia, BG Bulgaria	Rapid development; often EU-supported
NO FORMAL ROADMAP	No national framework	LU Luxembourg, MT Malta, LV Latvia	Small systems relying on ESFRI/international models
IN DEVELOPMENT	Roadmap planned or in prep	BE Belgium, RO Romania, CY Cyprus, TR Turkey	Early institutionalization phase

P3: National Roadmapping: some references for Ukraine

Aspect	Recommendation	Reference Model(s)
Roadmap Type	Formal National RI Roadmap (30–70 RIs)	CZ PL PT
Governance	Ministry + Funding Foundation partnership	NO FI
Update Cycle	Every 4–5 years	SE DK
Evaluation	Peer review, stakeholder panels	CZ PL
Legal/Policy Basis	Adopt clear legal framework	PT
EU Integration	Align with ESFRI methodology	FR PT CZ
Timeline	2025–2028 (RIFF support); launch by 2027–2028	—

P4: Case study – Chech Republic

What	Key Facts
Trajectory	First roadmap **2010** → updates **2011, 2015, 2019, 2024** (avg. **~2.8 yrs**; most frequent in Europe)
Scope (2024)	**43** large RIs across **6 domains**: Physical Sciences; Energy; Environment; Biomedicine; SSH; ICT/e-Infra
Governance	Lead: **MEYS** · Advisory: **Council for Large Infrastructures (~25)** · Expert WGs · International Evaluation Committee · Final approval by **Government Resolution**
Legal/ Funding	**Act 130/2002** defines LRI; **Gov. resolutions** for approval; **ERDF** for build/investment; **State R&D** for operations
ESFRI/ERIC	Active ESFRI alignment & multiple **ERIC** participations; timing coordinated with ESFRI cycles
Operating Model	**Roadmap ≠ funding** (inclusion is prerequisite; funding decided separately) · **Continuous monitoring** (annual, interim 2–3y, full 3–5y)

Why it stands out (at a glance)

- Frequent iterations keep strategy current
- Mandatory **international peer review**
- Systematic **landscape analysis** per discipline
- Transparent, published methodology and procedures

Bottlenecks to Watch

- **Evaluation burden** from frequent, comprehensive cycles
- **Funding–priority mismatch** in tight budgets
- **Portfolio breadth** (many RIs) → need clustering/synergies

P4: CZ Process and lessons learnt

Phase	Core Actions	Outputs
1. Strategy & Landscape	Council input; 6 expert WGs map strengths/gaps, clustering potential; EU/ESFRI alignment	Strategic priorities; discipline outlooks
2. Open Call	Any institution; staged Forms **A/B/C**; consortia encouraged	Complete proposal set with governance, access, business plan
3. Evaluation (2-Stage)	**Stage 1:** LRI definition (uniqueness, national importance, open access) · **Stage 2:** Intl. peer review vs. 8 dimensions (impact, uniqueness, mgmt & sustainability, access, RI's own R&D, cooperation, results, innovation) + interviews + harmonisation	Prioritisation **A1–A4** (quality tiers)
4. Approval & Monitoring	Advisory review → ministerial adoption → **Government Resolution**; separate funding decisions; annual/interim/comprehensive reviews	Approved roadmap; funded portfolio; performance loop

Lessons for Ukraine (actionable)

- Publish criteria & procedures from Day 1
- Run expert **landscape analysis** before calls
- Use **international peer review** + interviews
- Time roadmap to **ESFRI**; update **4–5y**
- Keep **roadmap ≠ automatic funding**; monitor & re-evaluate regularly

P4: Case study – Portugal (strategic alignment + maturity

Aspect	Key Facts (2020 Roadmap)
Governance	**Foundation for Science and Technology (FCT)** under Ministry of Science; manages roadmap, evaluation & funding
Legal Framework	**Decree-Law 63/2019** – formal legal basis for RI roadmapping (stability, continuity, alignment with EU norms)
Timeline	1st roadmap: **2014 → update 2020** (next ~2026)
Scope (2020)	**56 Research Infrastructures** across 6 domains:Health & Food (20), Physical Sci. & Eng. (14), Environment (7), Social & Cultural Innovation (7), Energy (4), Digital Infra (4)
ESFRI Alignment	**68% (38 of 56)** RIs linked to ESFRI / ERICs — highest in Europe
Funding Model	€143.8M (2017–2020): **68.6% EU ERDF**, **31.4% national**; aligned with Portugal 2020 & **RIS3** regional priorities
Maturity Evaluation (2019)	31-expert **Monitoring Committee** assessed all RIs across 8 dimensions — developmental, not punitive
Strategic Objectives	Excellence & internationalization · Alignment with national & regional R&I priorities · Open Science & FAIR data principles
Update Cycle	Continuous monitoring + periodic roadmap updates (~6 years), synchronized with EU programming cycles

P4: PT 4 stage process

Stage	Focus	Distinctive Feature
1. Continuous Update	Dynamic, responsive to: EU FP cycles, RIS3, Reform Plan, maturity results	Updates triggered by EU/strategic needs, not rigid timing
2. Open Call & Evaluation	ESFRI-aligned criteria: excellence, strategic relevance, feasibility	Mix of national + intl. experts; alignment with RIS3 mandatory
3. Maturity Evaluation	31 independent experts assess RIs' lifecycle stage & performance	Continuous improvement — actionable recommendations
4. Funding & Implementation	Multi-year grants; mix of EU ERDF + national + institutional co-funding	Funding linked to progress on maturity recommendations

P4: PT Good practices and key lessons

Good Practice	Impact / Value
68% ESFRI Alignment	Deep EU integration; reciprocity access to EU facilities; European credibility
Maturity Evaluation Framework	Developmental, not punitive; continuous improvement & accountability
Decree-Law 63/2019	Legal stability & transparency across political cycles
Multi-Source Funding	2:1 EU:national ratio; financial resilience; leverages cohesion funds
RIS3 Integration	RIs linked to regional smart specialisation; fosters regional innovation ecosystems
Open Science Mandate	FAIR data, EOSC integration, citizen science → transparency & EU alignment

Key Lessons for Ukraine

- **Codify roadmap in law** → stability, credibility
- **Adopt maturity-based evaluation** → build RIs' capability, not just select
- **Align early with ESFRI & EU programmes**
- **Design multi-source funding** (EU + national + institutional)
- **Integrate with regional innovation priorities** (RIS3 equivalent)
- **Embed Open Science & FAIR data** from the start

P4: Case Study – Norway (Innovation through

Aspect	Key Facts
Governance	**Research Council of Norway (RCN)** — national research funding agency under the Ministry of Education & Research
Legal/Strategic Framework	**National Strategy for Research Infrastructure 2018–2025**; RCN mandate for national RI strategy
First Roadmap	**2010** — among earliest in Europe
Update Cycle	**Biennial (every 2 years)** — synchronized with INFRASTRUKTUR funding calls
Funding Scheme	**INFRASTRUKTUR Initiative** ≈ NOK **740M/year** (~€75–80M)
Funding Model	**RCN covers capital investment only**; operations funded via **user fees + institutional contributions**
Core Principle	**Competition model:** all RIs (existing or new) compete equally for funding; roadmap ≠ guarantee
Structure	**Two-tier approach:** (1) Area Strategies (discipline-level) and (2) Roadmap Projects (national RIs)
Domains Covered	6 areas: Physical Sci. & Tech · Life Sci. & Med. · Env. Sci. · Soc. Sci. & Law · Humanities · Tech & Innovation
Evaluation Frequency	Biennial, merit-based, international expert panels
Funding Criteria	(1) National status · (2) Outstanding excellence · (3) Large-scale investment (>NOK 2–200M)

P4 – NO 5 stage process

Phase	What Happens	Distinctive Feature
1. Area Strategies	Discipline-level working groups identify future RI needs (10–15 yr horizon)	Bottom-up, transparent, published
2. Open Calls (INFRASTRUKTUR)	All institutions (new or existing RIs) compete for capital funding	Full competition; no guaranteed funding
3. Evaluation	Intl. expert panels (science + business expertise) + RCN admin review	Rigorous, merit-based, domain-sensitive criteria
4. Funding Decision	Highest-ranked proposals funded; others deferred	Quality-driven, budget-limited allocation
5. Monitoring	Annual reports, KPIs, site visits; re-competition after funding cycle	Continuous accountability & improvement

P4: NO Good practices and lessons learnt

Good Practice	Impact / Lesson
Competition Model	Prevents complacency · Maintains excellence · Allocates funds to best proposals
Area Strategies	Engages communities in defining needs · Ensures legitimacy & strategic clarity
Biennial Updates	Dynamic responsiveness to emerging science · Constant alignment with EU priorities
International Expert Panels	Combines scientific & business expertise · Ensures feasibility and realism
10-Year Dual Financial Plans	Separate construction vs operations budgets → sustainability focus

Dimension	Adaptation for Ukraine
Governance	Create **RI funding stream with regular competitive calls** (e.g. via Science Foundation)
Roadmap Process	Launch **area strategy consultations** before national roadmap drafting
Evaluation Model	Use **independent international experts**; flexible weighting by domain
Funding Principles	**Separate capital vs. operational funding**; require institutional co-funding
Accountability	Link continued funding to **performance & re-competition** every few years

P5: Comparative analysis and the future

Dimension	Czech Republic	Portugal	Norway	Implication for Ukraine
Update frequency	2–5 yrs	~6 yrs	~2 yrs (biennial)	Start 4–5 yrs; tighten to 3 yrs as capacity grows
Funding linkage	Roadmap ↔ separate budget	Roadmap tightly tied to funding via maturity	Full competition; merit decides	Begin loose linkage; tighten with maturity system
Guarantee of funding	No	Conditional (performance-based renewal)	No (re-competition)	Avoid guarantees; use performance conditions
Governance	Ministry + Council + Gov. resolution	Agency-led (FCT) + Decree-Law	Agency-led (RCN)	Ministry + Agency partnership, formalized
Competitive mechanism	Stable once approved	Developmental renewal	Full re-competition	Start developmental; add periodic competition
EU alignment	High (ERICs, ESFRI)	**Very high (≈68%)**	High (Nordic + ESFRI)	Target 50–60% now → 70%+ later

P5: Comparative analysis and the future

Universal Principles to Adopt

1.Clear governance 2) International peer review 3) Landscape analysis
2.Stakeholder engagement 5) Lifecycle planning 6) Explicit funding connection
3.Monitoring & evaluation (KPIs, annual reports, periodic reviews)

Model for initial consideration:

- **Governance:** Ministry lead + implementing agency + **National RI Council**
- **Evaluation:** Intl. peer review; criteria = **excellence, strategic relevance, feasibility, EU alignment**
- **Funding:** Multi-source (EU/reconstruction, national, institutional); **no automatic guarantees**
- **Maturity system:** Monitoring committee with **developmental** recommendations tied to renewals
- **EU integration:** Aim **50–60% ESFRI alignment** initially, growing to 70%+
- **Planning: 10-year** capital/operations plans; business model & host co-funding required

Bottom line: Build for credibility (peer review & transparency), sustainability (multi-source + lifecycle), and European integration (ESFRI)—with a developmental maturity system to help RIs improve, not just pass/fail.

RIFF

Thank you for your attention

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Research Infrastructures for the Future of Ukraine