



POLICY AND
BUSINESS
INTELLIGENCE

NUC
INFO

Gent-Paris-London

www.nuclear-21.net

WE ARE NUCLEAR-21

An independent expert cabinet providing bankable decision support driving policy, strategy, technology and business development towards optimised nuclear-based solutions

OUR SERVICES AIM TO

Identify and analyse the challenges our customers face in developing and using nuclear science- & technology-based solutions

Enrich policy, strategy, technology and business options

Support our customers in their policy, strategy, technology and business development activities

Recommend decisions based on proven, sector-specific expertise and quantitative, best practice methodologies

Broker solutions-focused international partnerships

Ensure compliance with national and international requirements and regulations

A Comprehensive Expertise(d) Core Team

Our Core Team are experienced senior experts driving towards making a difference in the nuclear sector together with our customers

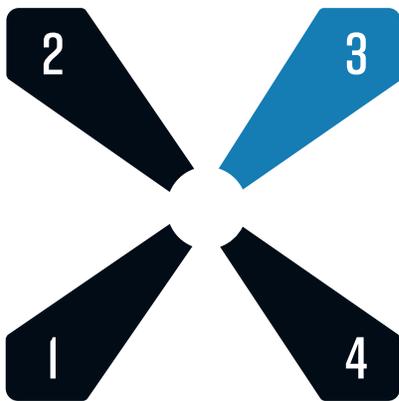
An International Reach

Our long-standing collaborative work with top-notch experts in various organisations worldwide maintains and secures our up-to-date best-practice based methodologies, tools and services

Scalability According To Your Needs

Our agile Core Team scales up with selected experts locally and globally whenever customer assignments require

THE FOUR ASPECTS OF OUR SERVICE OFFER ARE CENTRED AROUND OUR CUSTOMERS' NEEDS



1. Policy and Business Intelligence

technology, policy and business integration
 technology reviews
 competition analysis
 market assessments
 economic and financial risk assessments
 innovation process development
 partnering and funding options

2. Optioneering and Designing Strategies

policies and frameworks
 comprehensive plans
 provide validated market & business scenario models
 design enabling strategies
 risk-assessment of decisional options
 partnering and sourcing project funding
 due diligence and intellectual property analysis
 international technology transfer and process industrialisation
 knowledge management and expert sourcing

3. Decisioneering

modelling and simulation of policy, strategy and business options
 future developments projection
 baseline studies
 Financial performance verification"
 Documentation and communication of critical decisions"
 accompanying due diligence processes"

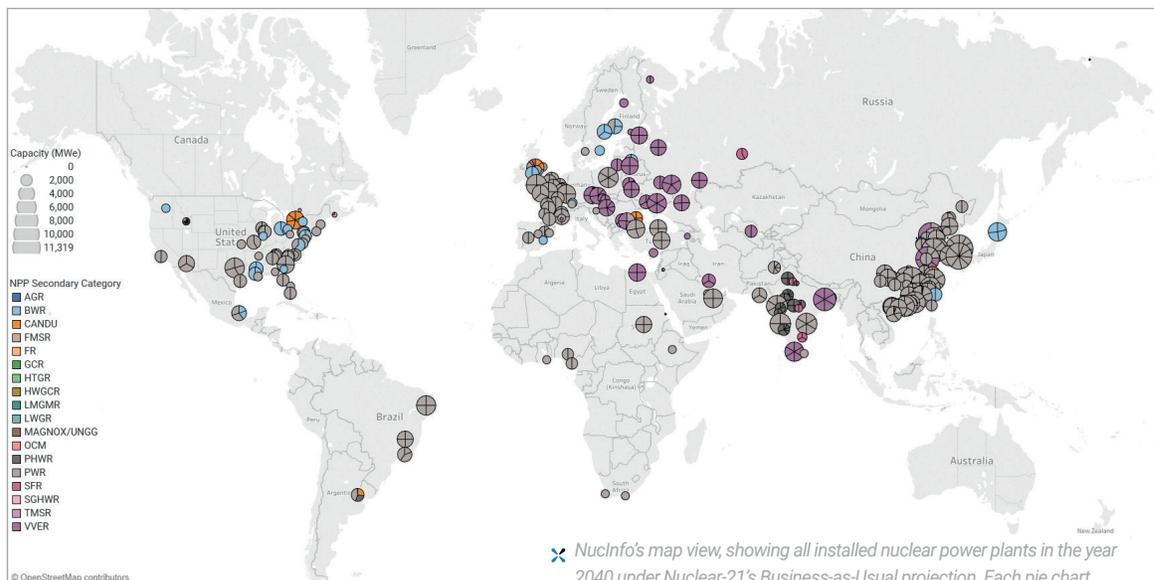
4. Optimising Implementation

project initiation & guidance
 project funding & partnering support
 project operationalisation
 process and project evaluations
 performance benchmarking
 business development & commercial offer support
 support to win new markets

NUCINFO – THE INTEGRATED NUCLEAR ENERGY SYSTEMS VISUAL DATABASE

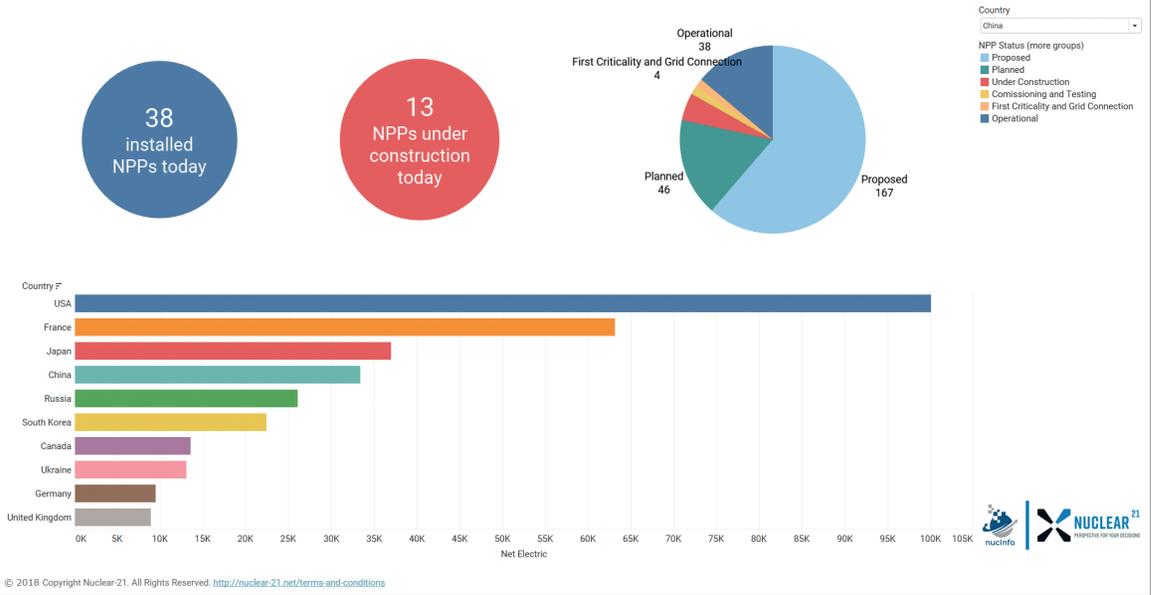
NucInfo is the go-to source for all your data needs and is used as the basis of our optioneering and decisioneering services.

NucInfo presents nuclear energy system data in interactive infographics, allowing you to sort through the information and easily get the answers you need in a well-presented format that you can use immediately.



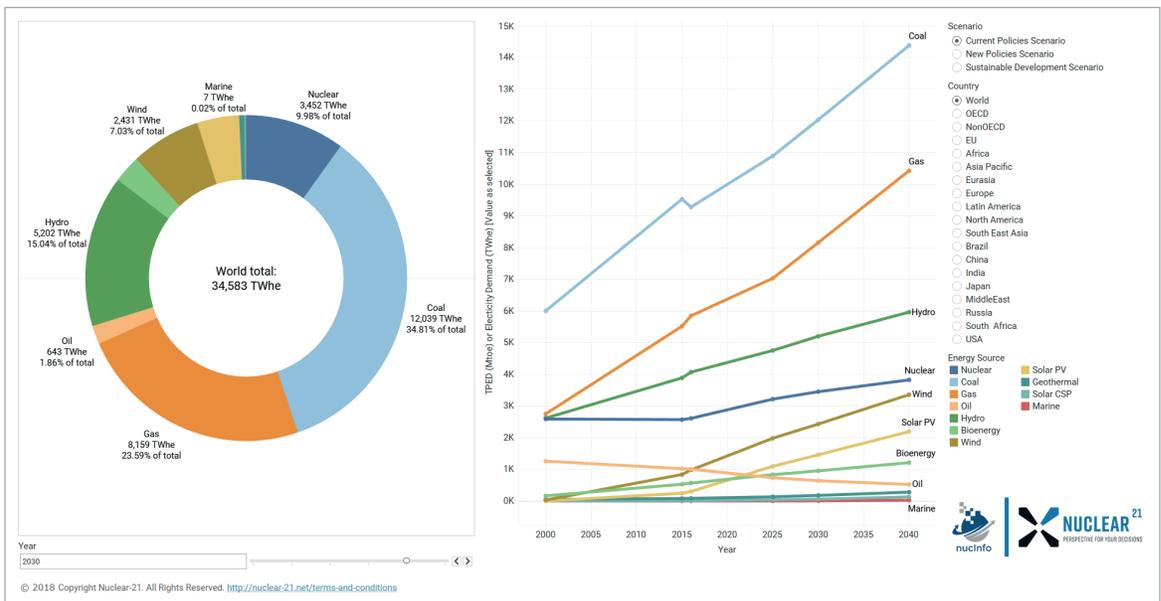
With comprehensive data on every nuclear power plant, information on nuclear fuel cycle facilities, nuclear materials inventories, and a range of other supporting information, NucInfo integrates data from many sources and Nuclear-21's assessments into one package ensuring credible and referencable information in your optioneering and decisioneering.

Current Status of all NPPs, and Countries with the Largest Installed Nuclear Capacities



NucInfo brings the user a wide range of nuclear energy systems information taken from public data sources and Nuclear-21's own deep data mining activities. Where no verifiable data is available, Nuclear-21's experts complete the database with many decades of experience working across the whole nuclear sector, while our researchers continually seek to replace expert assumptions by documented data.

In NucInfo, we bring together data from international bodies such as the IAEA, OECD-NEA/IEA, national governments, technology developers, fuel cycle service providers, electrical utilities, energy journalism, and many other sources. All published data is cross-checked, referenced and verified by our experts before being accepted into NucInfo.



WHAT DATA IS CURATED WITHIN NUCINFO?

Fuel cycle front-end:

- Data on fuel cycle facilities, from mining to fuel fabrication, including location, status, scale, key lifecycle dates, and capacities
- Fuel materials resource and inventory data: Natural uranium and thorium data (RAR, EAR, IR) and DU tails inventories (and assay) by country
- Historic and projected capacity and demand for nuclear fuel materials (natural uranium and thorium, plutonium, depleted uranium, reprocessed uranium) and fuel cycle services (conversion, enrichment, uranium oxide and mixed oxide fuel fabrication)

Geographic and socio-economic data:

- Country identifying information, including ISO standard codes
- Country membership of international groups (European Union, Nuclear Supplier's Group, CANDU Owner's Group, BRIC(S) countries, Organisation for Economic Co-operation and Development, Commonwealth of Independent States)
- Country signatory status to international non-proliferation treaties
- Definition of regions and continents
- Evolution of country energy balances over time
- Country socio-economic data: population, Gross Domestic Product, Human Development Index
- National survey results for nuclear energy approval

Economic data:

- Capital investment and operational costs NPPs
- Fuel cycle service costs

Nuclear power plants:

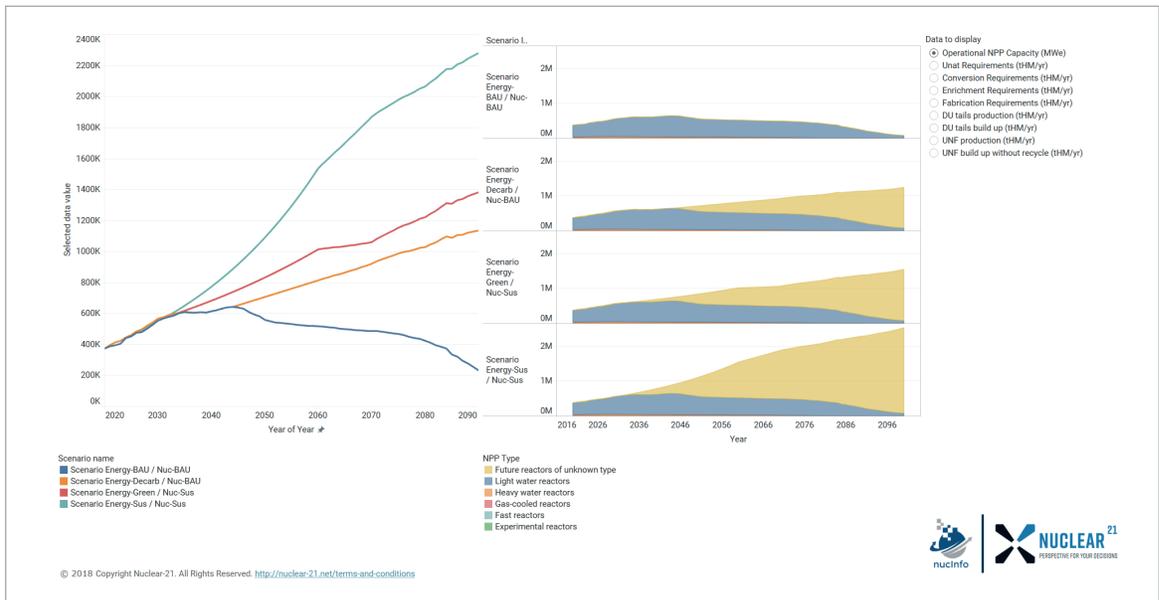
- Plant name and IAEA identifying code
- Plant location by country, state, nearest city, and site, as well as latitude and longitude coordinates,
- Plant equipment generation (i.e. I - IV), type (e.g. BWR) and technology name
- Plant status tracking, including proposed/planned plants with confidence level that the plant will eventually operate. Over 30 lifecycle statuses are tracked
- Key lifecycle dates, including first concrete, first criticality, grid connection, commercial operation, and temporary and permanent shutdown(s)
- Thermal, gross, design net and updated power ratings and performance data, including load factor, annual time online and electricity supplied
- Core management – core batching, fuel cycle length
- Plant design parameters – Plant lifetime, target performance factors, fuel enrichment and target burnup, thermal efficiency
- Plant stakeholder information: Reactor plant designer, tracking of architect-engineer, owner and operator over plant lifetime
- Nuclear fuel specifications: composition and enrichment

Fuel cycle back-end:

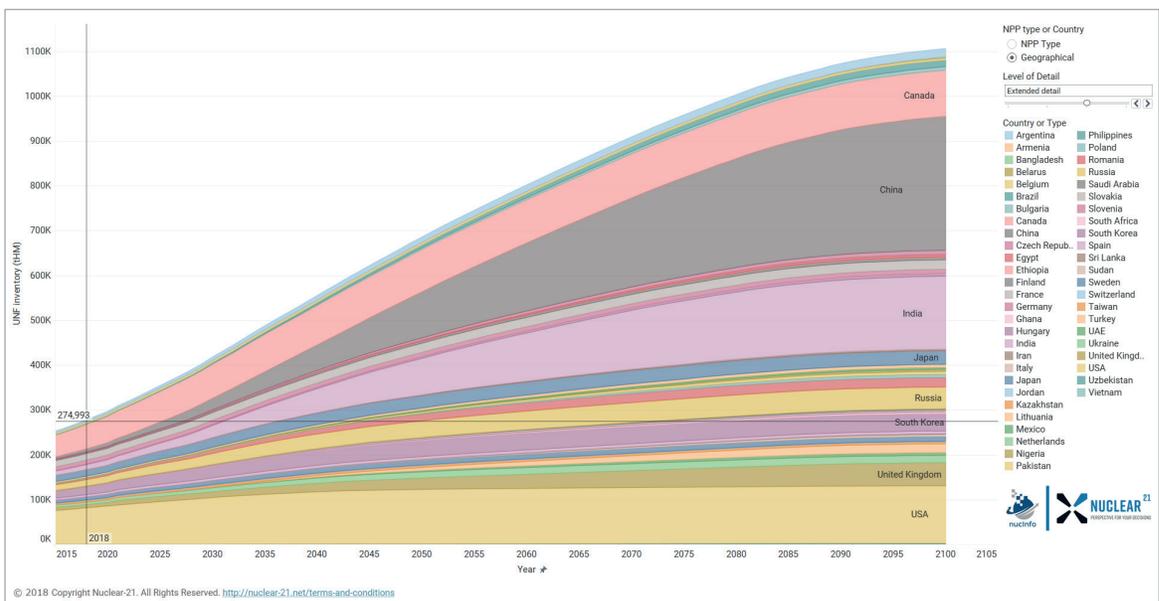
- Data on back-end fuel cycle facilities, including interim storage facilities (at-reactor and centralised), and geological disposal and reprocessing facilities
- Data on used fuel inventories, including isotopic composition data, inventories of wastes, reprocessed uranium and plutonium inventories
- Historic and projected capacity and demand for nuclear fuel cycle services

PROJECTING THE FUTURE WITH NUCINFO

A key feature of Nuclnfo is the suite of included future nuclear energy scenarios. Nuclear-21 maintains a set of four in-house scenarios, and these are supplemented by data on other scenarios published by the International Energy Agency, the World Energy Council, the IAEA and various commercial organisations.



✘ Projected nuclear power plant fleets for the four Nuclear-21 defined world nuclear energy deployment scenarios



✘ Projected inventory of used nuclear fuel in a Business-as-Usual scenario

NUCINFO WITHIN NESSAT

NuclInfo is a component of the Nuclear Energy System Strategies Assessment Toolbox – NESSAT.

NESSAT is a suite of modelling tools for nuclear energy system scenarios, allowing integrated simulation of the technical, economic and financial aspects of nuclear energy systems. NESSAT tools are used extensively by Nuclear-21 in the delivery of our market intelligence, optioneering and decisioneering services. NuclInfo acts as the primary data source for the other NESSAT tools, which include:

DANESS

A code which models the evolution of nuclear energy systems over time, tracking fuel materials usage and inventories, nuclear power plant and fuel cycle facility histories and investment profiles.

FCCM



An economic model for fuel cycle costing based on net present value analysis, used for the rapid modelling of decisions with short timescales.

NROM



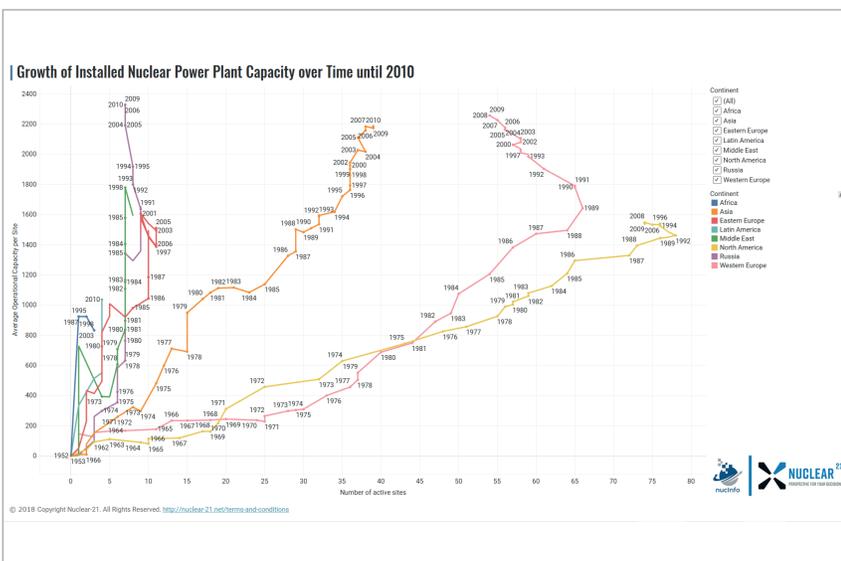
An advanced dynamic financial modelling tool, used in the optimisation of financial cost and risk exposure in nuclear energy decision making.

DEMA



A dynamic energy market model allowing time-evolving energy mix analysis.

✕ Fuller details on these tools are available in our other brochures, or from <https://nuclear-21.net/nessat>.

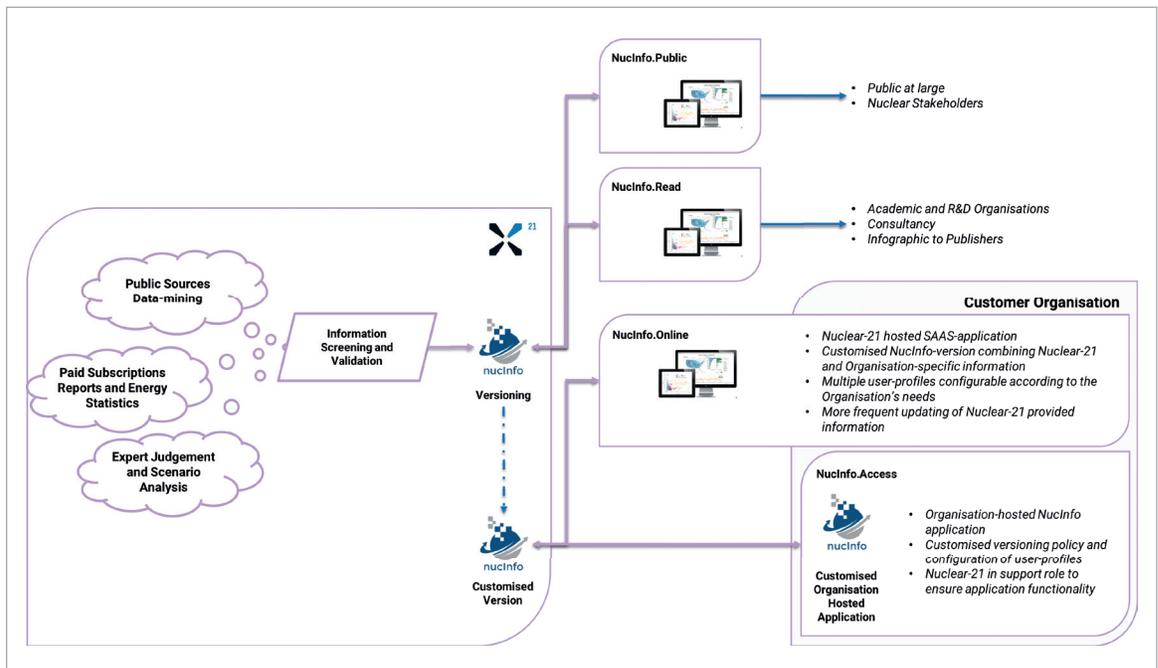


NuclInfo Services

Don't want an annual subscription, or do you have specific needs related to your planned use of NuclInfo? We offer a range of services where Nuclear-21 can use NuclInfo on your behalf and deliver data and results, or develop specific NuclInfo visualisations and/or functionalities for your organisation. If you are interested in such services, please contact info@nuclear-21.net for additional details.

NUCINFO VERSIONS ARE FITTED TO EVERY NEED

| | NucInfo.Public | NucInfo.Read | NucInfo.Online | NucInfo.Access |
|-----------------------------------|--|---|--|---|
| (Nuclear) Energy Scenarios | <ul style="list-style-type: none"> Three world-level 'Nuclear-21' nuclear energy scenarios, which are aggregates of various nuclear energy scenarios Market shares of nuclear energy | <ul style="list-style-type: none"> Six regional (nuclear) energy scenarios including 'Nuclear-21' nuclear energy scenarios as aggregates of various nuclear energy scenarios | <ul style="list-style-type: none"> Access to all world/regional/country (nuclear) energy scenarios dating from the early 2000's including 'Nuclear-21' nuclear energy scenarios | <ul style="list-style-type: none"> Full access to scenario data with possibility to include customised scenarios |
| Front-End Fuel Cycle | <ul style="list-style-type: none"> World-level view of past and projected front-end fuel cycle requirements and production <ul style="list-style-type: none"> U_{res} /Th reserves/resources Conversion Enrichment Fabrication DU-inventory | <ul style="list-style-type: none"> Detailed balance for each region and country Detailed balance for each NPP and fuel type (UOX, MOX, ...) | <ul style="list-style-type: none"> Detailed balance for each NPP-site, NPP-plant and utility Front-end fuel cycle capacity evolution on world, regional and country-level | |
| Nuclear Power Park | <ul style="list-style-type: none"> World/regional/country-level view of past and projected NPP-park | <ul style="list-style-type: none"> Detailed view for each NPP-site and each utility, OEM, NSSS-supplier Statistics on built-to-operate, load-factors, power uprates | <ul style="list-style-type: none"> Statistics on core-management Spent Fuel storage capacities (at-reactor pool, on-site interim storage) | <ul style="list-style-type: none"> Full access to data with possibility to include customised 'what-if' scenarios to analyse impacts on nuclear energy systems mass/inventory balances |
| Back-End Fuel Cycle | <ul style="list-style-type: none"> World/regional/country-level view of past and projected back-end fuel cycle for three defined fuel cycle scenarios (once-through, partial-recycling, multi recycling) | <ul style="list-style-type: none"> Detailed view of spent fuel arising at the levels of world/region/country/NPP-site/NPP/Utility Fuel cycle facility capacities Spent fuel and separated material mass-flows and inventories, e.g. Pu, RepU inventories | <ul style="list-style-type: none"> Various scenarios for back-end fuel cycle options on regional/country-level Fuel cycle facility deployment scenarios Evolution of materials isotopic composition | <ul style="list-style-type: none"> Automated online updating of NucInfo's database with latest information provided by Nuclear-21 |
| Waste Management | <ul style="list-style-type: none"> World/regional/country-level view on spent fuel and HLW arising and inventory | <ul style="list-style-type: none"> Detailed view of spent fuel arising at the levels of world/region/country/NPP-site/NPP/Utility | <ul style="list-style-type: none"> Various scenarios for waste management options on regional/country-level Geological disposal anticipated deployment capacity | |
| Economics | <ul style="list-style-type: none"> Public data on competitiveness of nuclear energy | <ul style="list-style-type: none"> Averaged NPP and fuel cycle facility and services cost database | <ul style="list-style-type: none"> Detailed NPP and fuel cycle facility and service cost database including access to references | |
| User Proprietary Data | No | No | Yes | Yes |
| Updates | Twice annually | Quarterly | Monthly | Continuous |



✕ Beyond the NucInfo.Public and NucInfo.Read versions, organisation-customised versions can be provided ensuring alignment with market & business intelligence processes.

HOW MAY NUCINFO ENRICH YOUR NEEDS?



As the main infographics engine of the NESSAT-toolbox, NuInfo can be applied and further customised to fit your specific needs, such as:

- Market analysis on world, regional, country/utility-level allowing segmenting of the market
- Supporting your marketing and communication plans towards multiple stakeholders
- Commercial support by providing customer/market/region-specific version(s) to your commercial team
- Prospect and Service options analysis presenting your team and customers the results of various service offers
- Investment and financial risk analysis, in combination with other NESSAT tools, to optimise your investment and offer plans within uncertain market context

TYPICAL APPLICATIONS OF NUCINFO

Providing referenceable assumptions in policy, technology and business foresighting

- Nuclnfo ensures that historic data ully valued in assessing trends towards foresight studies
- Facilitating optioneering discussions by shared unique data-sourcing across an organisation
- Visualising a range of future scenarios in comparison to business-as-usual practices

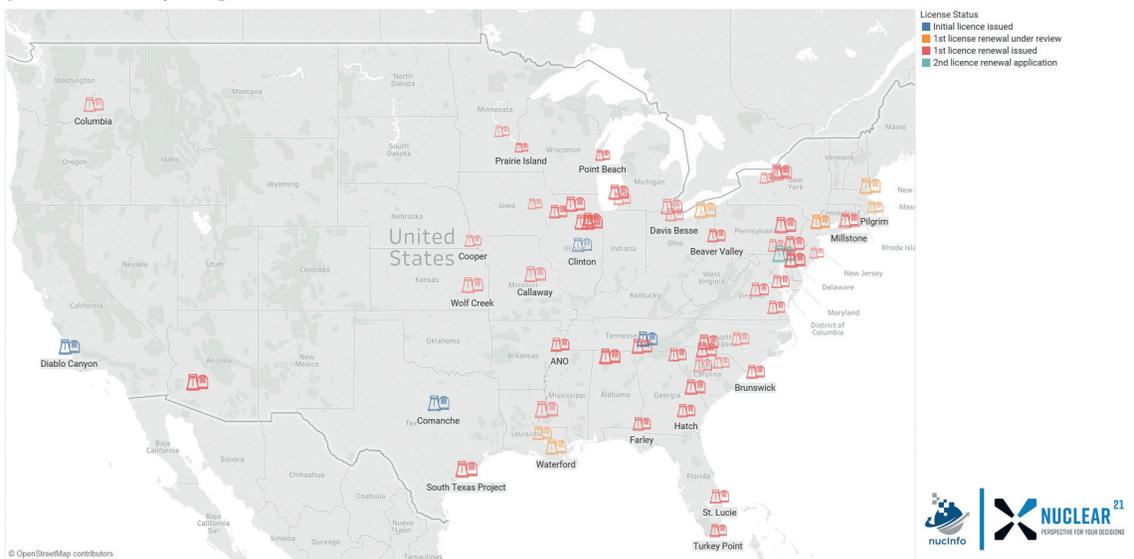
Guaranteeing and supporting your proprietary market and business intelligence

- Nuclnfo provides the data-framework with proven functionalities, allowing you to to embed organisation-specific proprietary data (which may be compared to the Nuclear-21 provided data)
- Nuclnfo ensures market & business intelligence coherence within organisations by guaranteeing versioning of data and providing read-accessible and customised infographics to the various teams within your organisation

Credible information for your stakeholders

- Nuclnfo provides an unbiased traceable information resource to your stakeholders and allows you to provide due diligence proof for your business;
- Nuclnfo’s infographics are readily available in your marketing and commercial undertakings and are referenceable independently

License Status of Operating NPPs in the United States of America



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