

REGULATORY FRAMEWORK and LICENSING in TÜRKİYE

Dr. Serhat ALTEN
Consultant

Contents

- Republic of Türkiye –Country and nuclear power program
- Nuclear Infrastructure – Infrastructure on nuclear energy and safety
- Safety Regime – National and international activities
- Licensing Process – Authorization of nuclear facilities and activities

CONTENTS

Republic of
Türkiye

Nuclear
Infrastructure
Safety Regime
Licensing Process

Population: 85+ M

Area: 780.000 km²

Installed capacity:
105.7 GW by 09/2023

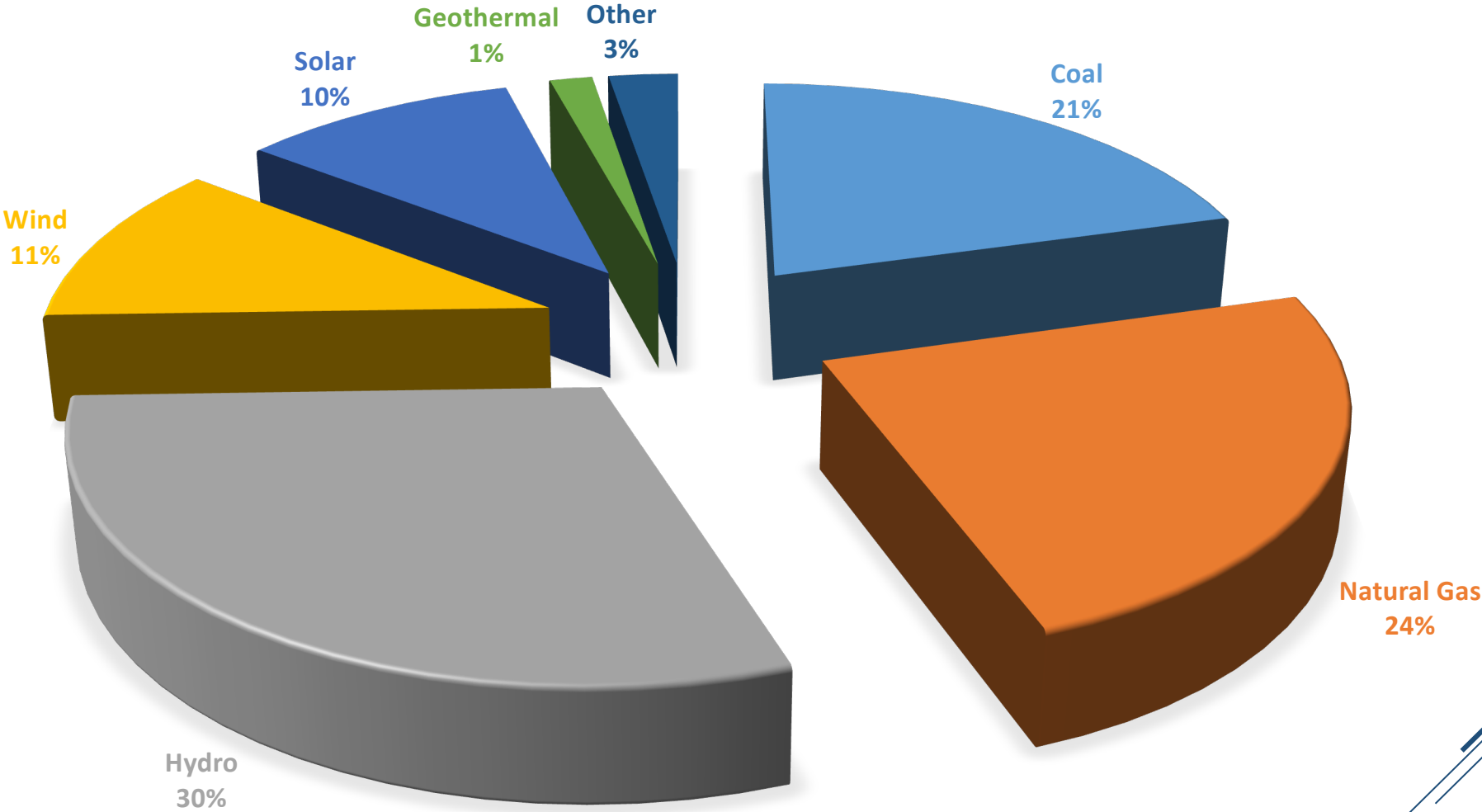
Electricity consumption:
328.3 TWh in 2022



CONTENTS

Republic of
Türkiye
Nuclear
Infrastructure
Safety Regime
Licensing Process

ELECTRICITY PRODUCTION IN 2023



CONTENTS

- Republic of Türkiye
- Nuclear Infrastructure
- Safety Regime
- Licensing Process



CONTENTS

Republic of
Türkiye
Nuclear
Infrastructure
Safety Regime
Licensing Process

Akkuyu NPP (ANS)

- Intergovernmental Agreement between Türkiye and Russian Federation to build 4 units of VVER-1200 in Akkuyu site by Build-Own-Operate model (May 2010)
- Akkuyu Nuclear JSC, a Turkish company established by Russian stakeholders, is the owner and licensee for ANS
- Reference plant is Novovoronezh II of Russian Federation
- Akkuyu site, licensed as NPP site in 1976
 - All site investigations were repeated to update the old license with new nuclear safety understanding, and site parameters were derived and approved

CONTENTS

Republic of
Türkiye
Nuclear
Infrastructure
Safety Regime
Licensing Process

Akkuyu NPP (ANS)

- All units of ANS are licensed for construction separately starting from 2018
 - First concrete on ANS 1 in April 2018
 - Some design changes based on findings of review and assessment for construction license
 - Design change on sea structures because of technical difficulties encountered
 - Dome closed in ANS 1 as of 31 December 2022
- Construction of all units with one year phase difference
 - Over 25 000 workers on site
- Commissioning permit
 - Application for ANS 1 in March 2023, additional information in August
 - Decision is expected in November 2023

CONTENTS

Republic of
Türkiye
Nuclear
Infrastructure
Safety Regime
Licensing Process

Sinop NPP (SNS)

- Original project on building 4 units of ATMEA-1 through an IGA with Japanese Government has been cancelled after feasibility study
- Turkish public company for electricity production (EÜAŞ) applied for EIA for Sinop site and received affirmative decision in September 2020
- A new subsidiary of EÜAŞ, TÜNAŞ (Türkiye Nuclear Energy JSC) recognized as the new project company in January 2023 upon letter of intent, no vendor is specified in letter of intent
- Site license application made in May 2023
 - Detailed review commenced in June 2023
 - Decision is planned for June 2024

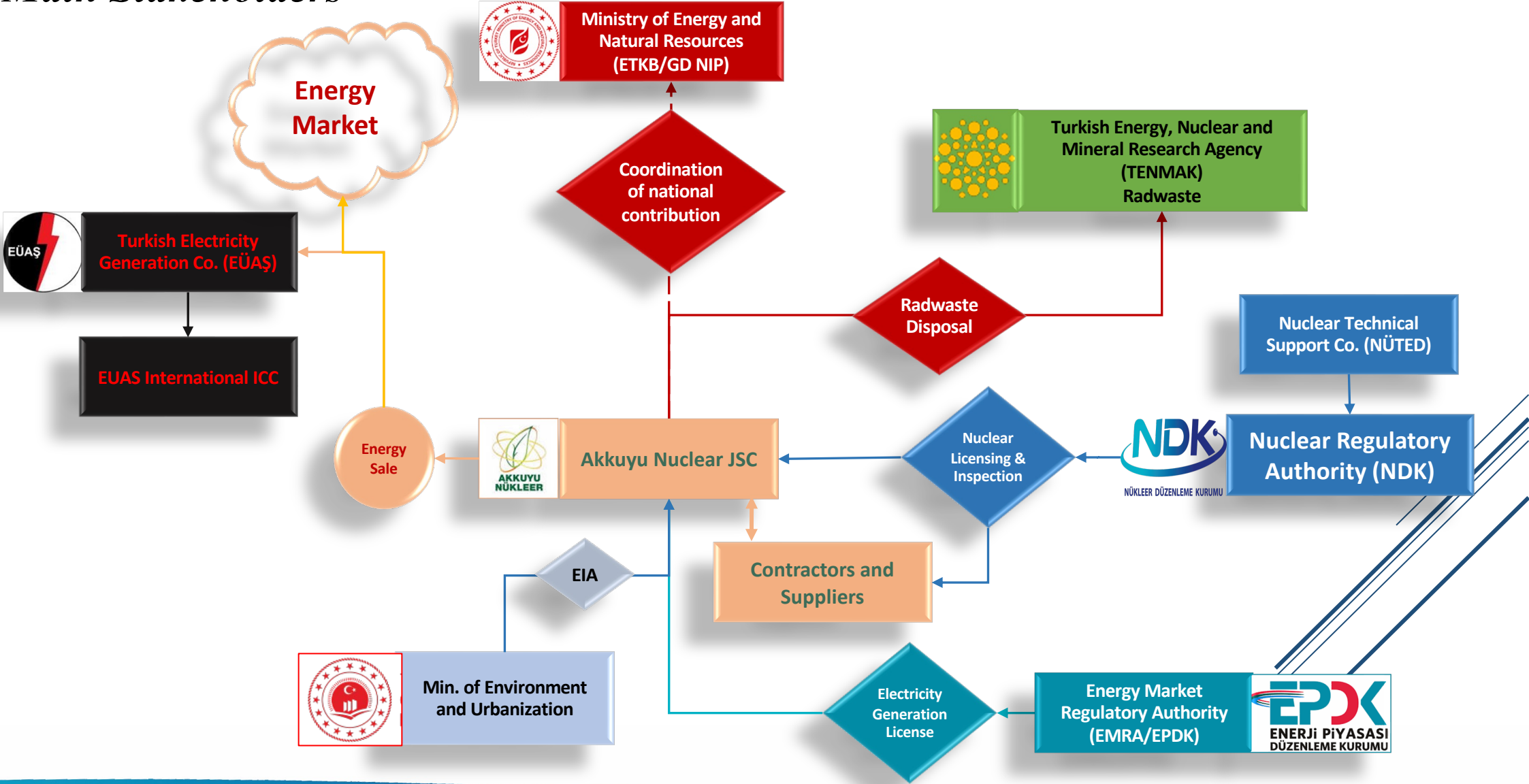
Third NPP

- While western end of the Black Sea region is under consideration, site or vendor selection process is still underway

CONTENTS

Republic of
Türkiye
Nuclear
Infrastructure
Safety Regime
Licensing Process

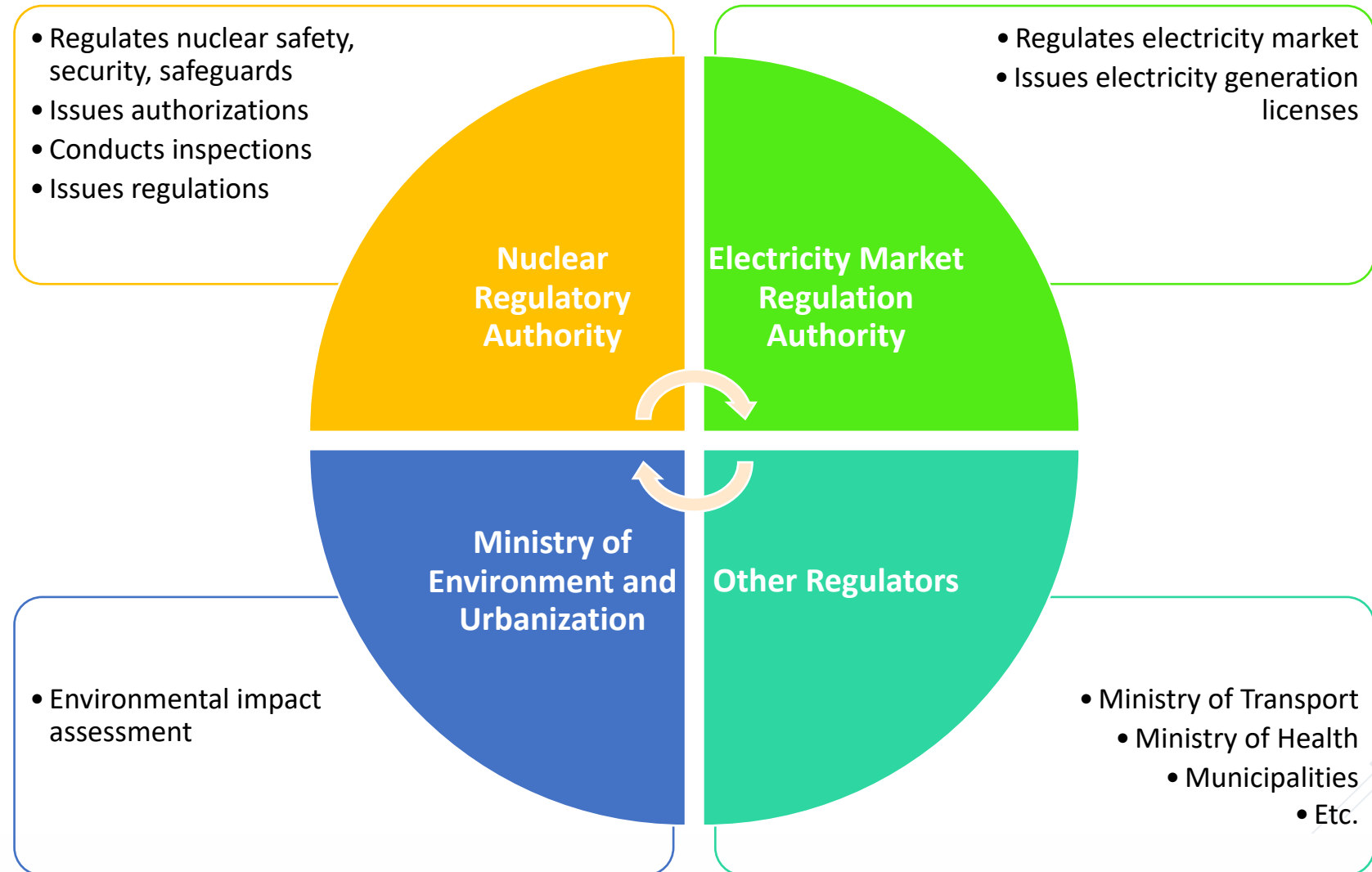
Main Stakeholders



CONTENTS

Republic of Türkiye Nuclear Infrastructure Safety Regime Licensing Process

Main Regulators



CONTENTS

Republic of
Türkiye
Nuclear
Infrastructure
Safety Regime
Licensing Process

Nuclear Regulatory Authority (NDK)

- Established in July 2018 by two presidential decrees as an independent regulatory body on
 - Radiation protection
 - Nuclear, radiation and waste safety
 - Nuclear security, safeguards and
 - Radiological emergency
- Composed of Board of Governors and the Authority
- Took over regulatory duties (and most of the regulatory staff of TAEK) in 2019 when the Board of Governors are assigned
- Reinstated on legal level by the Nuclear Regulation Law
- www.ndk.org.tr

CONTENTS

Republic of
Türkiye
Nuclear
Infrastructure
Safety Regime
Licensing Process

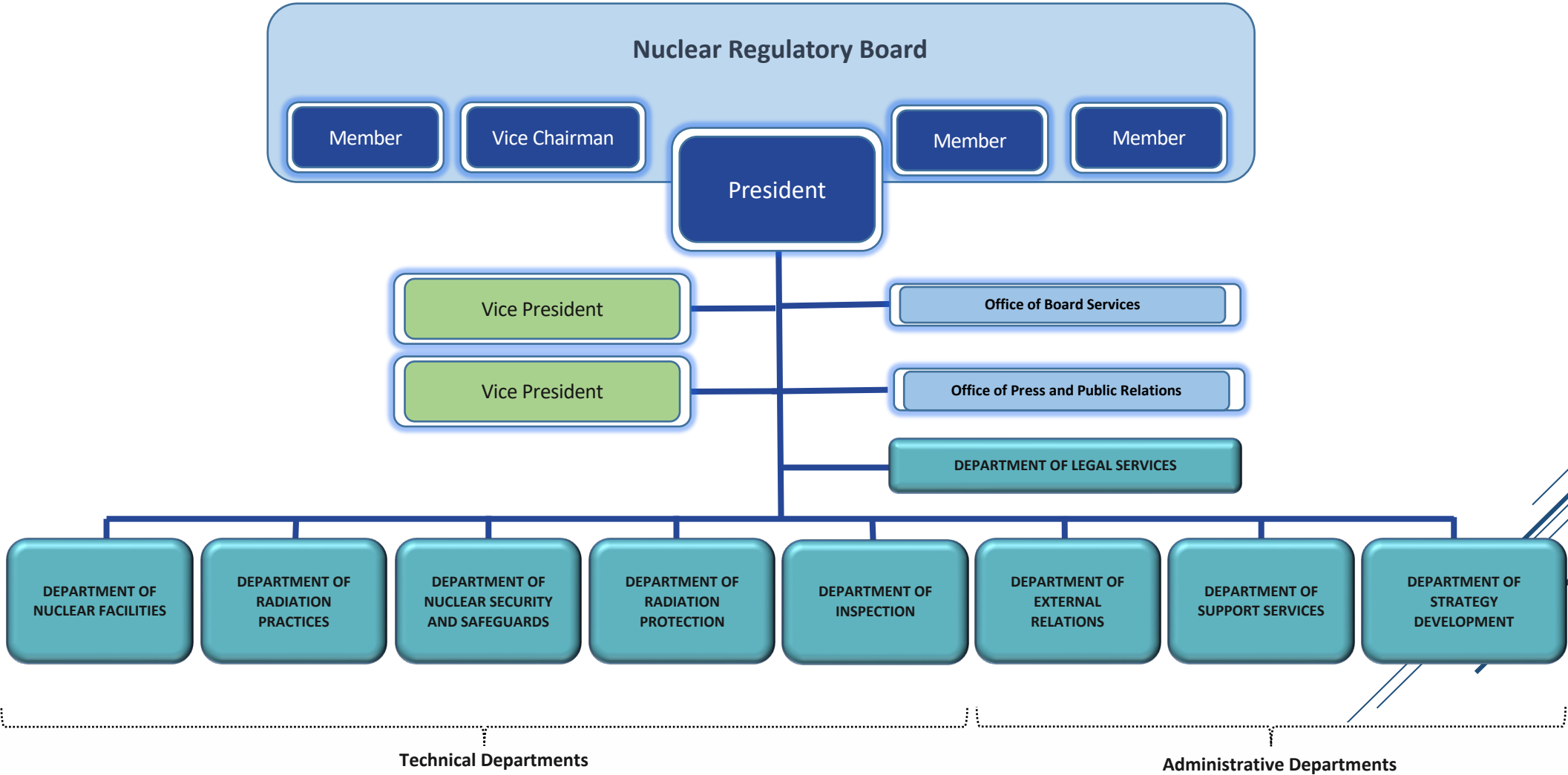
Nuclear Regulatory Authority (NDK)



CONTENTS

Republic of
Türkiye
Nuclear
Infrastructure
Safety Regime
Licensing Process

Nuclear Regulatory Authority (NDK)



CONTENTS

Republic of
Türkiye
Nuclear
Infrastructure
Safety Regime
Licensing Process

Bilateral Peaceful Use

- USA, Canada France, South Korea, Russia, Argentina, *Germany, China, Jordan, Japan*

Multilateral Safety Related

- Nuclear Safety Convention
- Paris Convention on Liability
- Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Joint Convention on Management of Spent Fuel and Management of Radioactive Waste

CONTENTS

Republic of
Türkiye
Nuclear
Infrastructure
Safety Regime
Licensing Process

Multilateral Security Related

- Treaty on the Non-proliferation of Nuclear Weapons
- Convention on The Physical Protection of Nuclear Material (ratification of Amendment to CPPNM is in process)
- Comprehensive Nuclear Test Ban Treaty
- International Convention for the Suppression of Acts of Nuclear Terrorism

Safeguards

- Agreement Between the Government of the Republic of Turkey and the IAEA for the Application of Safeguards in Connection with NPT
- Protocol Additional to the Agreement Between the Government of the Republic of Turkey and the IAEA for the Application of Safeguards in Connection with NPT

CONTENTS

Republic of
Türkiye
Nuclear
Infrastructure
Safety Regime
Licensing Process

Nuclear Regulatory Law

- Regulates the facilities and activities, laying out responsibilities of relevant parties
 - NDK to regulate safety, security and safeguards
 - TENMAK (Turkish Energy, Nuclear and Mineral Research Agency) to provide services for radioactive waste
 - Definition of roles and responsibilities of other governmental organizations
- Addresses issues like
 - Prime responsibility
 - Authorizations
 - Radioactive waste management
 - Decommissioning
 - Funds for radioactive waste management and decommissioning

CONTENTS

Republic of
Türkiye
Nuclear
Infrastructure
Safety Regime
Licensing Process

Mandatory Regulations

- All existing regulations are under revision to ensure conformance with new regulatory infrastructure and framework
- Using 2022 IRRS Mission findings as additional input
- Additional regulations are drafted and issued as necessary
- 35 Regulations, 14 are updated, 21 to go, on safety, security and safeguards on the level of IAEA safety requirements,
 - Radiation protection, radiation safety, management system, safety of nuclear installations or safe transport of radioactive materials, etc.
- 26 of which are applicable to the nuclear facilities and activities

CONTENTS

Republic of
Türkiye
Nuclear
Infrastructure
Safety Regime
Licensing Process

Guidelines, internal procedures, etc.

- Eight guidelines for the applicants
 - Format and content of site report, format and content of SAR for Research Reactors, specific (national) design criteria, classification of radiation areas...
- About 25 internal procedures, including review and assessment guidelines
- Two Project Management Plans for ongoing authorization projects for two NPPs

CONTENTS

Republic of
Türkiye
Nuclear
Infrastructure
Safety Regime
Licensing Process

General Approach

- Multistep Licensing
 - Recently revised based on lessons learned from the Akkuyu NPP licensing
- Determination of Licensing Basis
 - List of regulations to be used during the authorization process
 - Includes Turkish legislative and regulatory documents and IAEA Safety Requirements
 - Applicant may propose additional third-party documents if they are used in Safety Analyses Report, subject to approval of Nuclear Regulatory Board
 - The guides, codes and standards are kept as a separate list based on mutual agreement
- External support to be used on specified areas (including national technical support organization NUTED established by the Nuclear Regulation Law)

CONTENTS

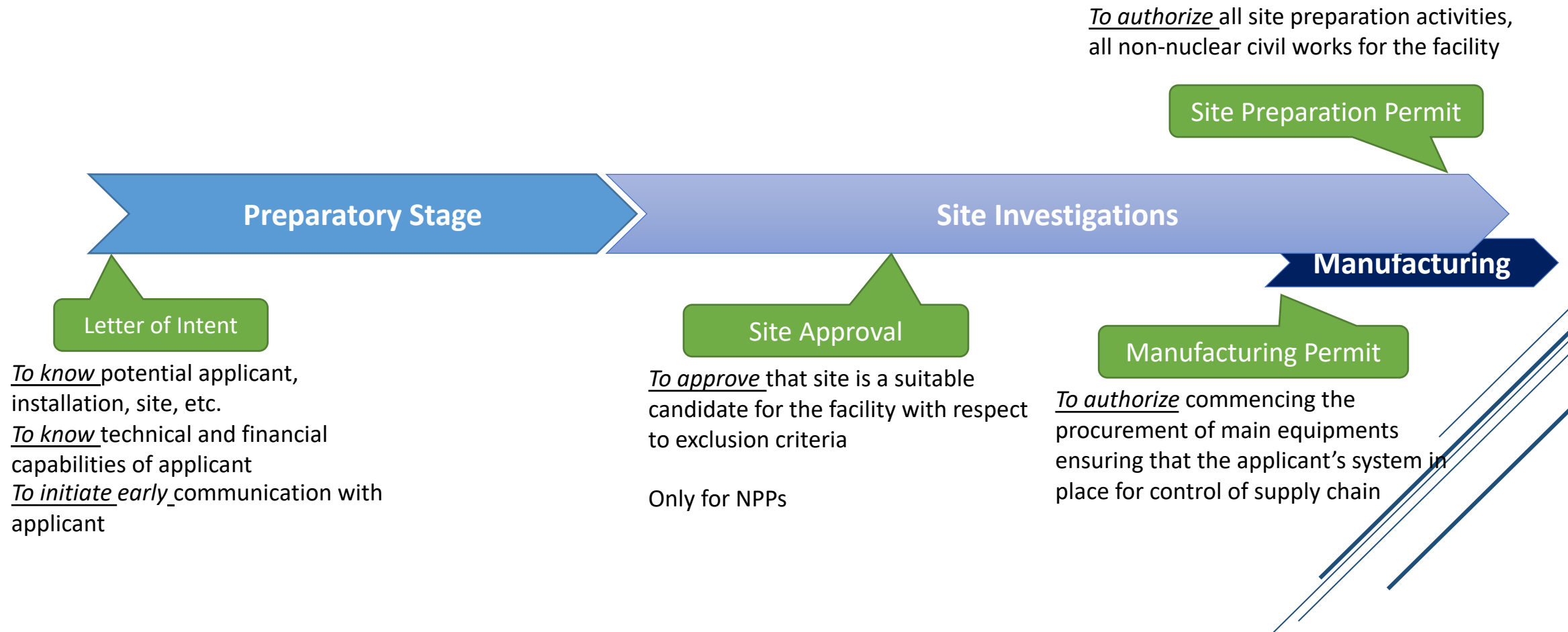
Republic of
Türkiye
Nuclear
Infrastructure
Safety Regime
Licensing Process

Regulations defining the authorization process

- Regulation on Authorizations Regarding Nuclear Installations
 - Process of licensing
 - Main authorizations in stages (licenses, permits and notifications/recognitions)
 - Information to be provided for each application
 - What is to be reviewed by NDK
- Regulation on Equipment Procurement Process and Approval of Manufacturers for Nuclear Installations
 - Procurement permit
 - Approval of manufacturing of long lead items and manufacturers
- Regulation on Construction Inspection in NPPs
 - Approval of third-party inspection organizations

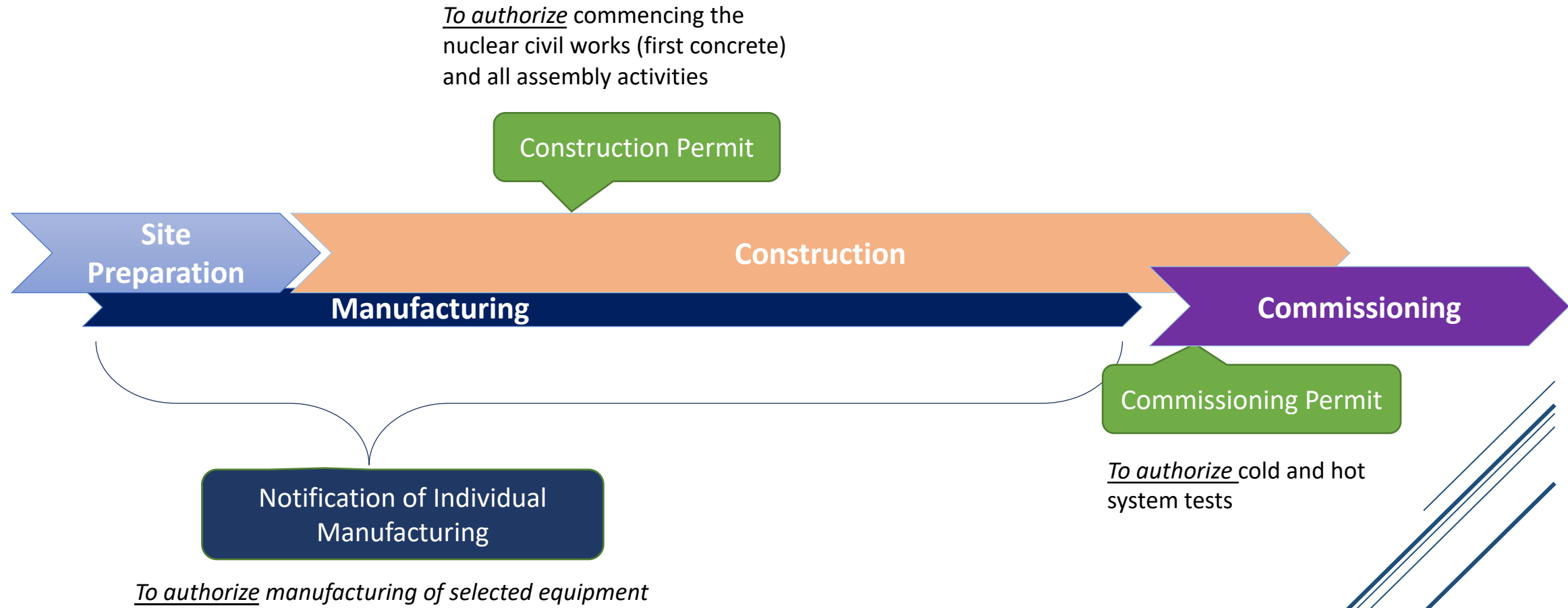
CONTENTS

Republic of Türkiye Nuclear Infrastructure Safety Regime Licensing Process



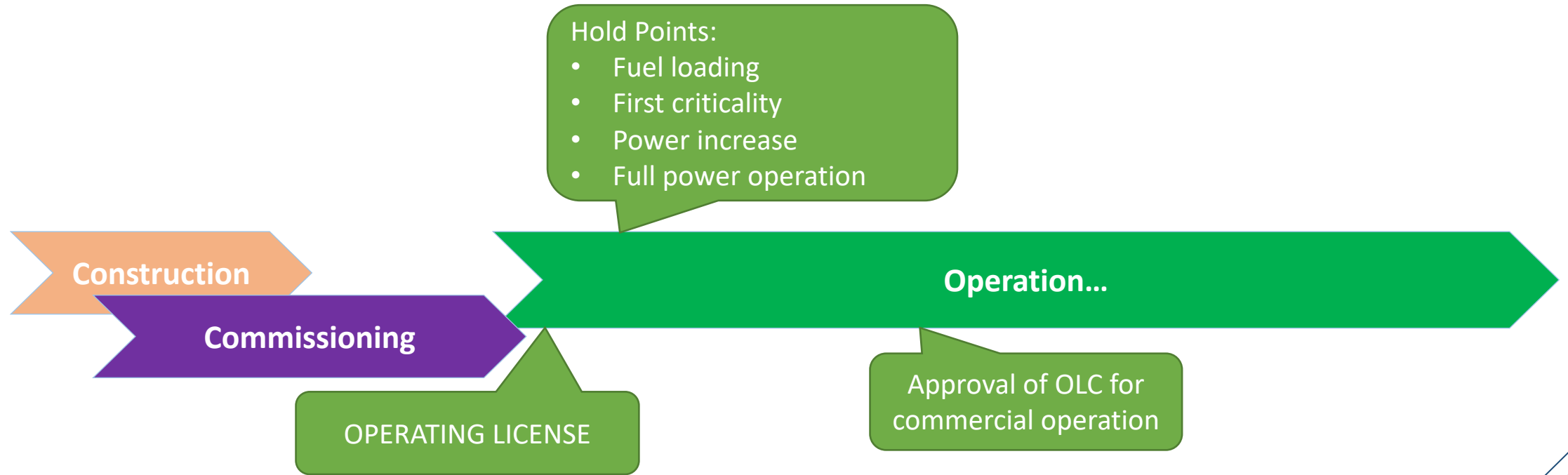
CONTENTS

Republic of Türkiye Nuclear Infrastructure Safety Regime Licensing Process



CONTENTS

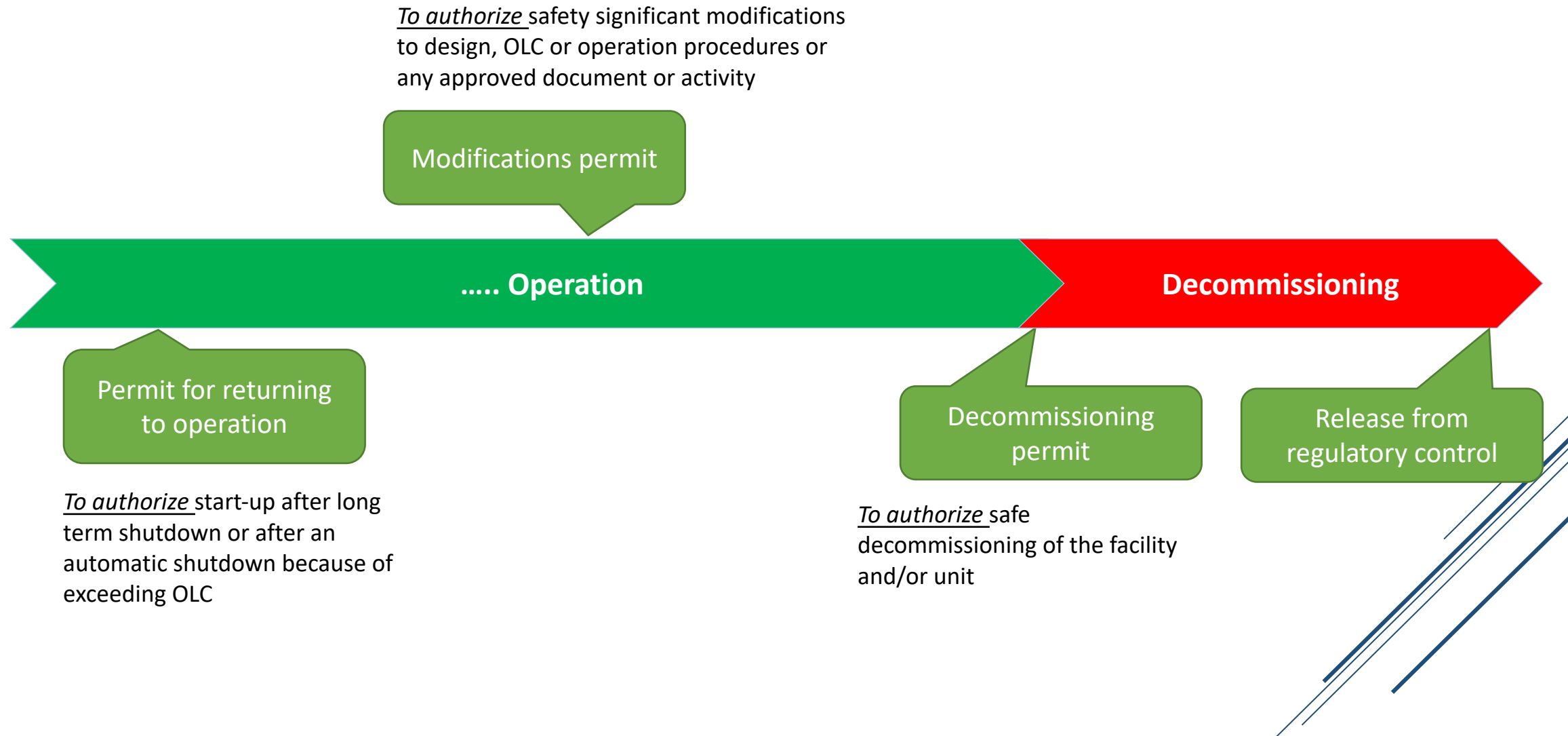
Republic of Türkiye Nuclear Infrastructure Safety Regime Licensing Process



To authorize operation, starting with loading the fuel to the core
Hold points before first criticality, power uprate, and full power trial operations
Commencement of commercial operation if OLC is approved at the end

CONTENTS

Republic of Türkiye Nuclear Infrastructure Safety Regime Licensing Process



CONTENTS

Republic of
Türkiye
Nuclear
Infrastructure
Safety Regime
Licensing Process

THE END...

Thanks for your patience!...

