

# MINING AND MINERALS SECTOR

## R&D Roadmap for the Value-adding of Non-metallic Minerals

### Overall Strategies

#### Human Resource

- Capacitated researchers on advance extraction technology for critical elements (REE, Trace Elements and valuable metals) for emerging technology application
- Trained researchers on developing innovative products for industrial application

#### Facilities and Services

- Establishment of the Niche Center for Marble, Limestone and Clay/Ceramics Researches
- Upgraded a laboratory to offer service on ore characterization using Laser Induced Breakdown Spectroscopy
- Put-up a laboratory for the extraction of Critical Elements

#### R&D Technologies

##### Clay

- Armor plates for armed personnel

##### Bauxite

- Improvement of silica content

##### Coal

- REE estimation and extraction from CFA

##### Marble/Clay/Limestone

- Resource Estimation and Grading of deposits
- Advance/Innovative technology for the value-addition of marble, clay and limestone

##### Perlite

- Light weight aggregates for construction

##### Silica

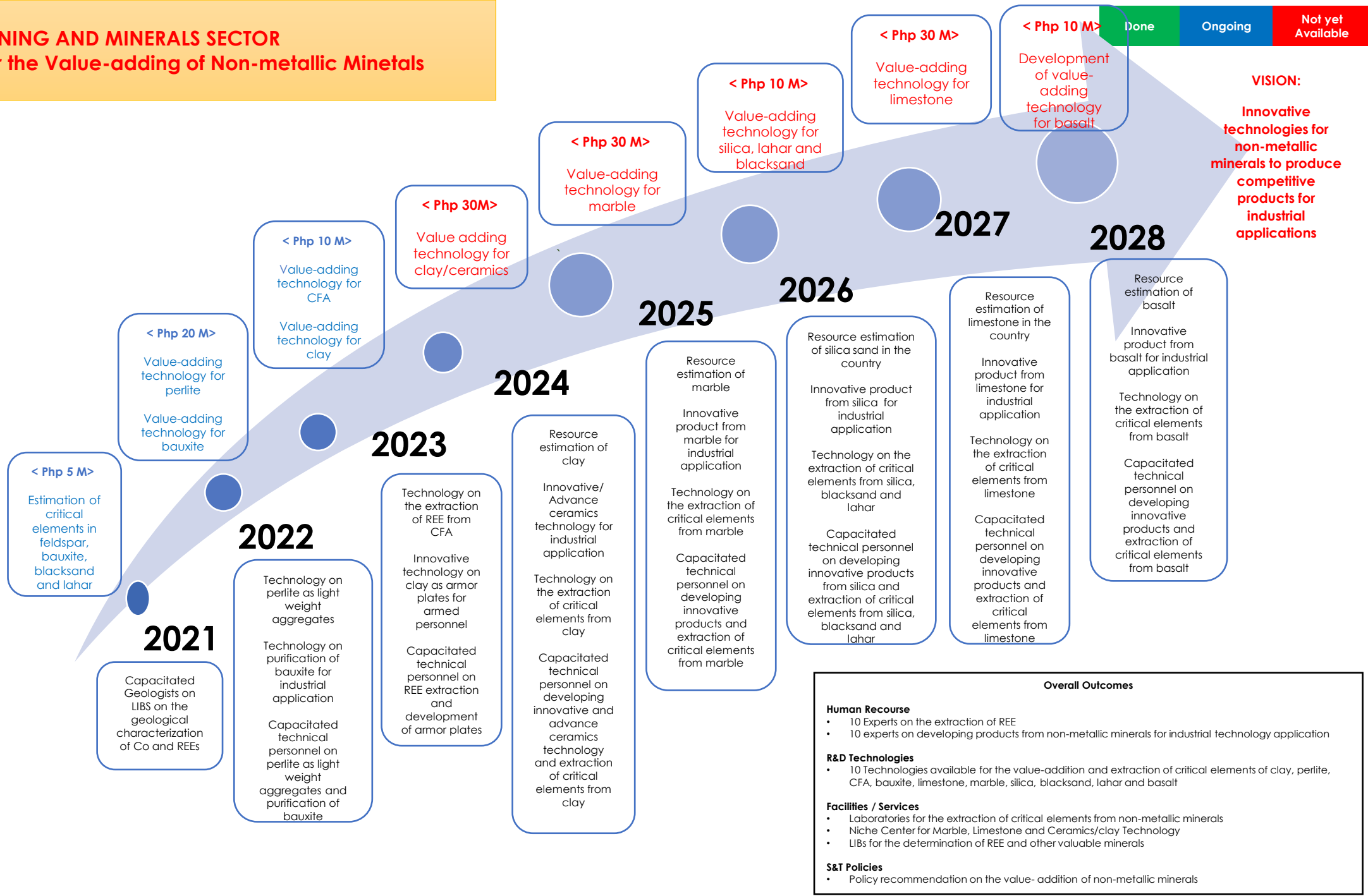
- Resource estimation, extraction of critical elements and technology for the value-addition of silica

##### Blacksand/Lahar

- REE estimation and extraction

##### Basalt

- Resource estimation, extraction of critical elements and technology for the value-addition of silica



### Overall Outcomes

#### Human Resource

- 10 Experts on the extraction of REE
- 10 experts on developing products from non-metallic minerals for industrial technology application

#### R&D Technologies

- 10 Technologies available for the value-addition and extraction of critical elements of clay, perlite, CFA, bauxite, limestone, marble, silica, blacksand, lahar and basalt

#### Facilities / Services

- Laboratories for the extraction of critical elements from non-metallic minerals
- Niche Center for Marble, Limestone and Ceramics/clay Technology
- LIBs for the determination of REE and other valuable minerals

#### S&T Policies

- Policy recommendation on the value-addition of non-metallic minerals