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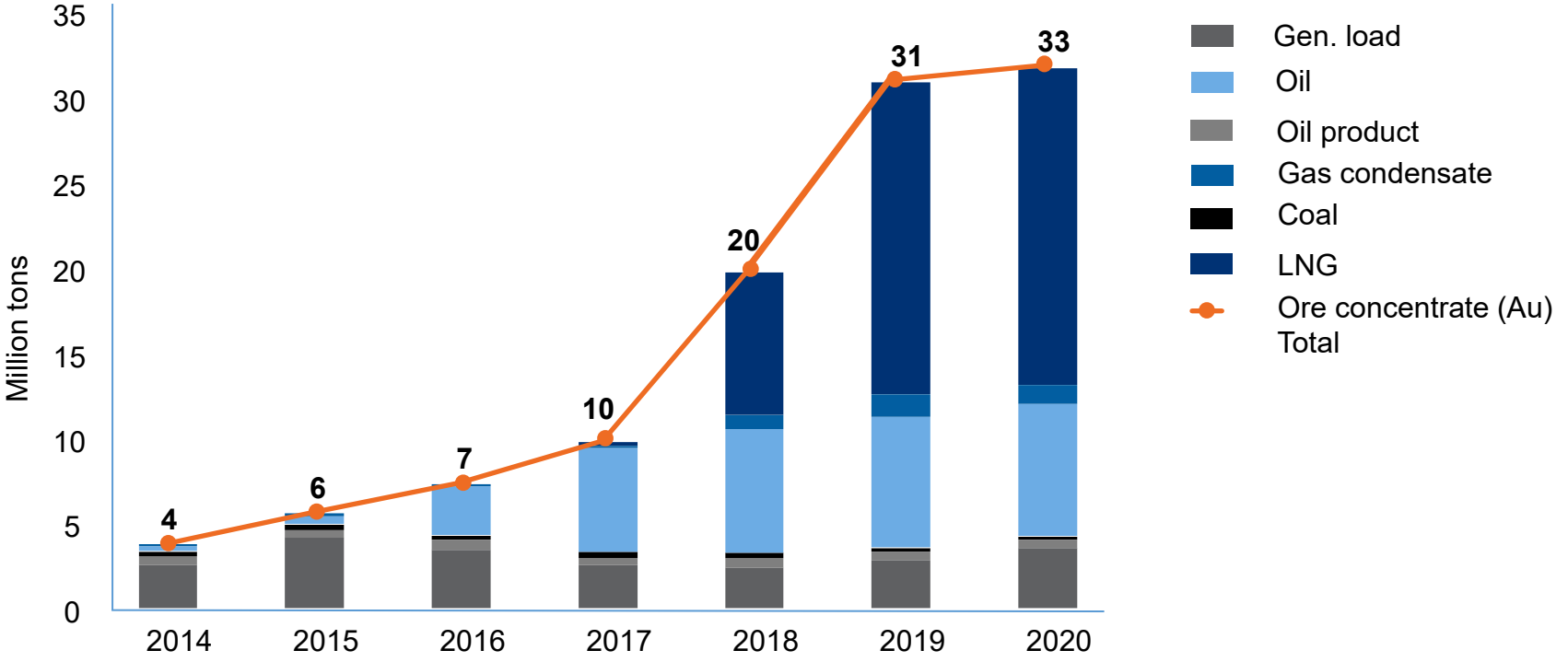
Development of sustainable NSR shipping

Vladimir Panov
Special representative of Rosatom for Arctic development
Deputy Chairman of the State Commission for Arctic Development

1.

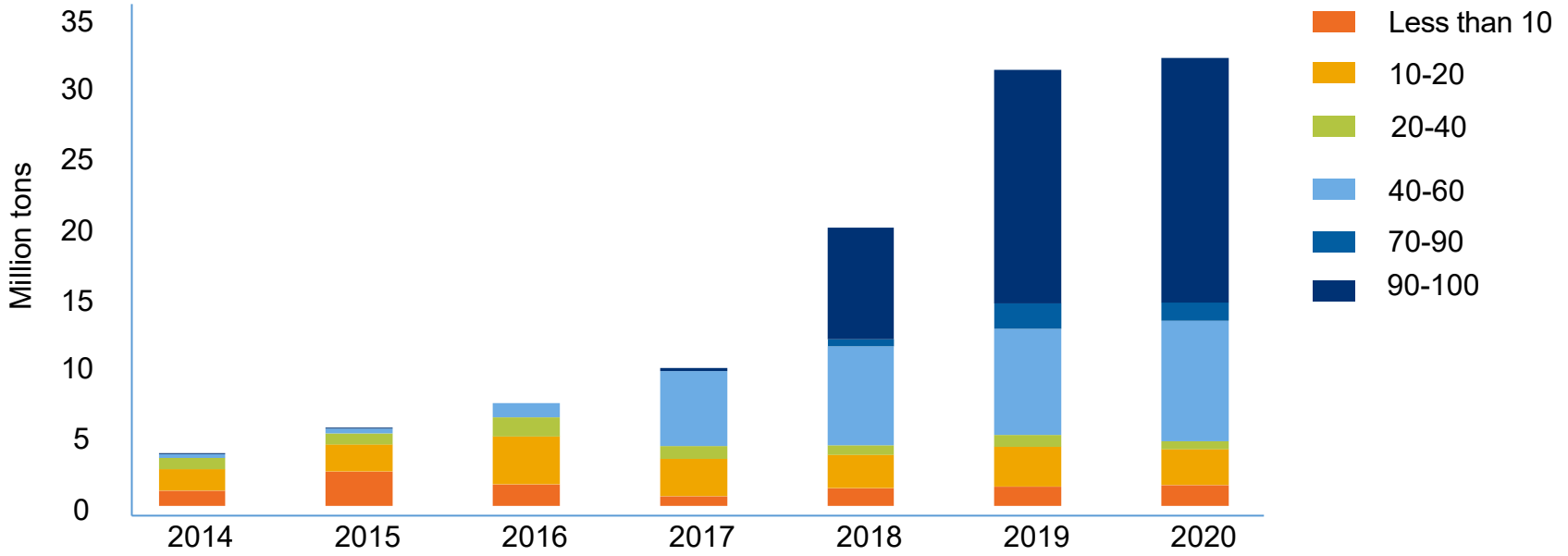
Results of NSR development, 2020

Dynamics of import & export and coastal shipping

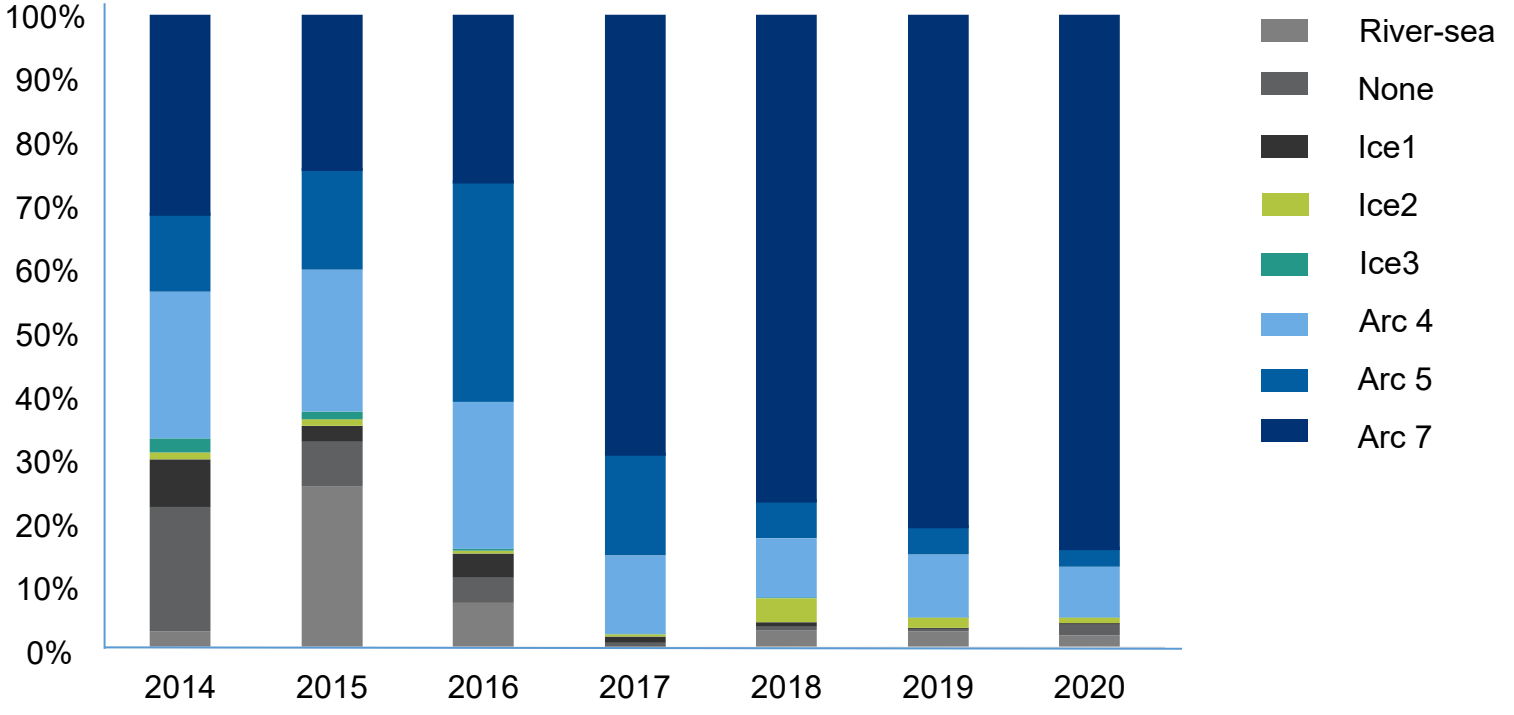


Import & export and coastal shipping by various deadweight capacity vessels

Groups of vessels by deadweight, thous. tons



Import & export and coastal shipping by vessels of various arctic classes



LNG supplies to Europe and Asia markets in 2020

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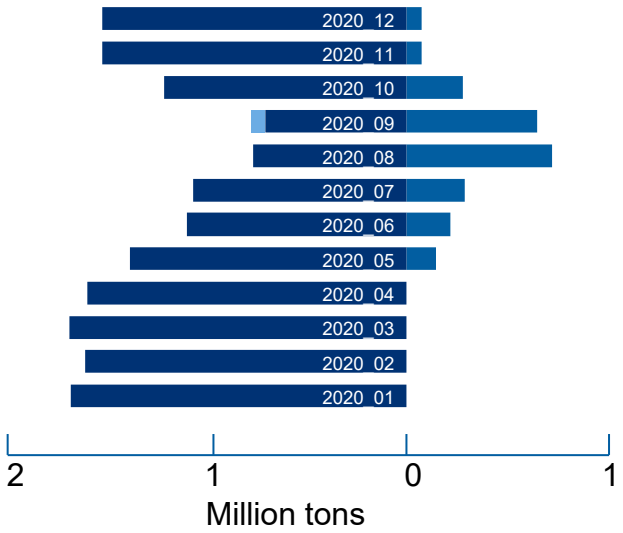
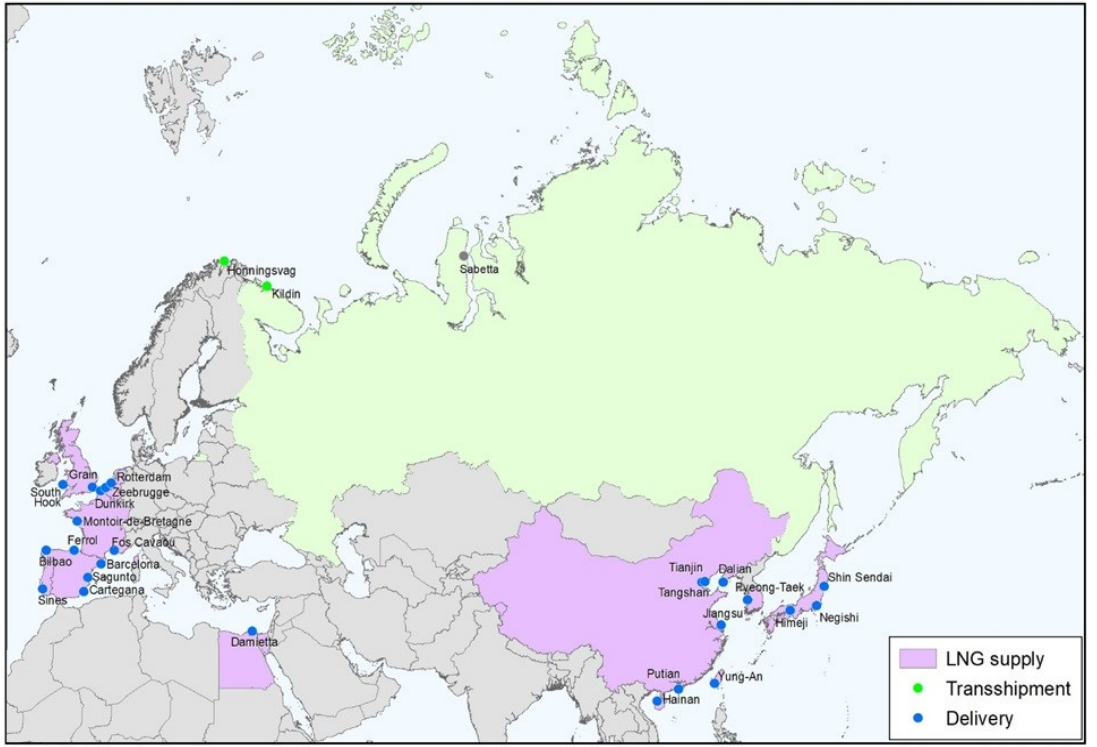
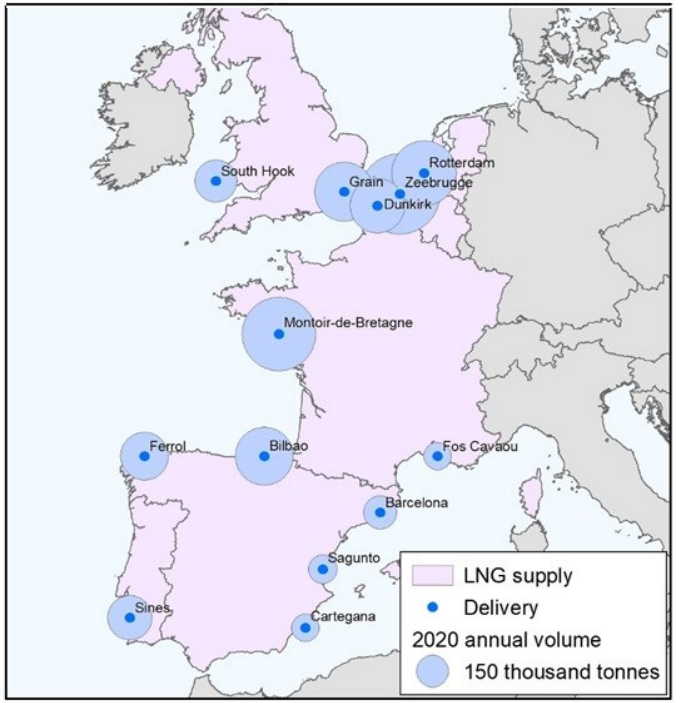
Directions of LNG deliveries



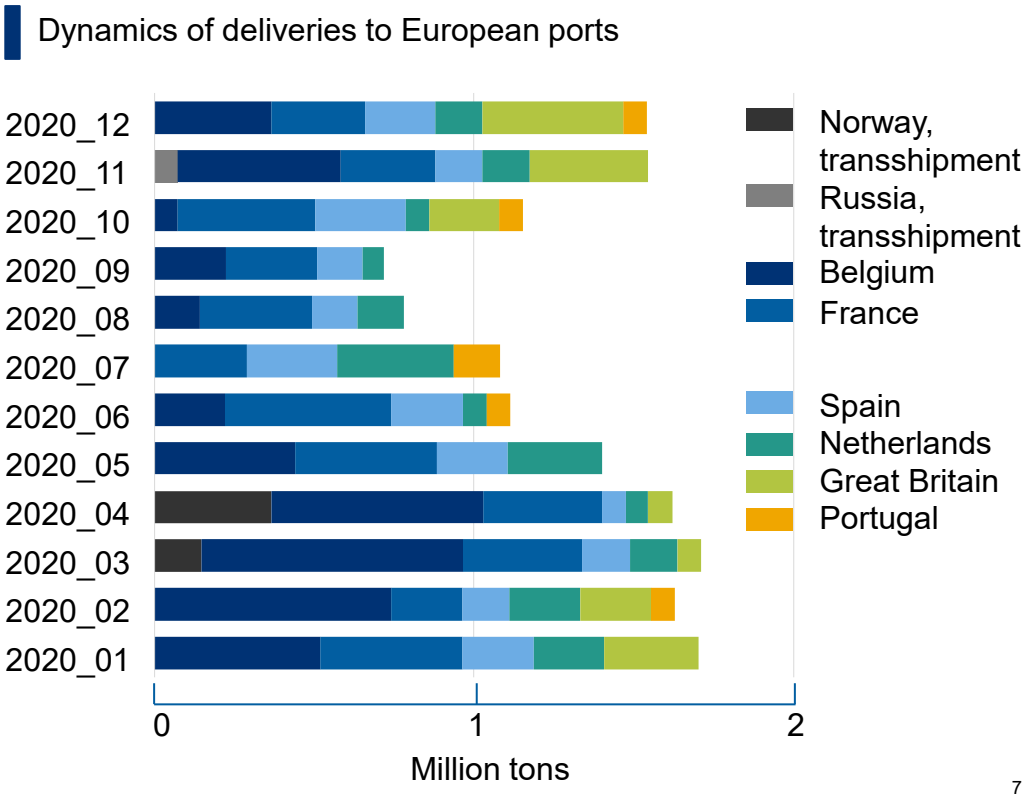
- To Asia
- To Europe
- To Asia through Europe



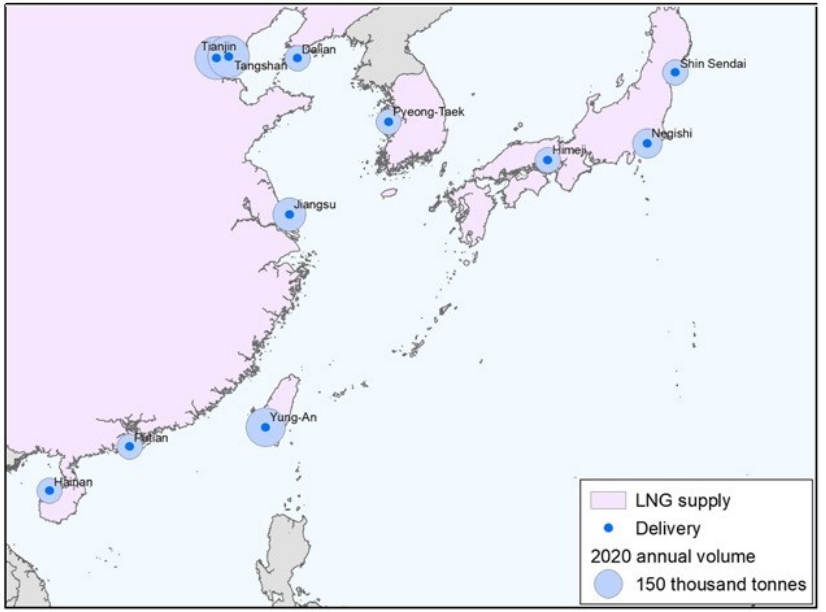
LNG supplies to the European markets in 2020



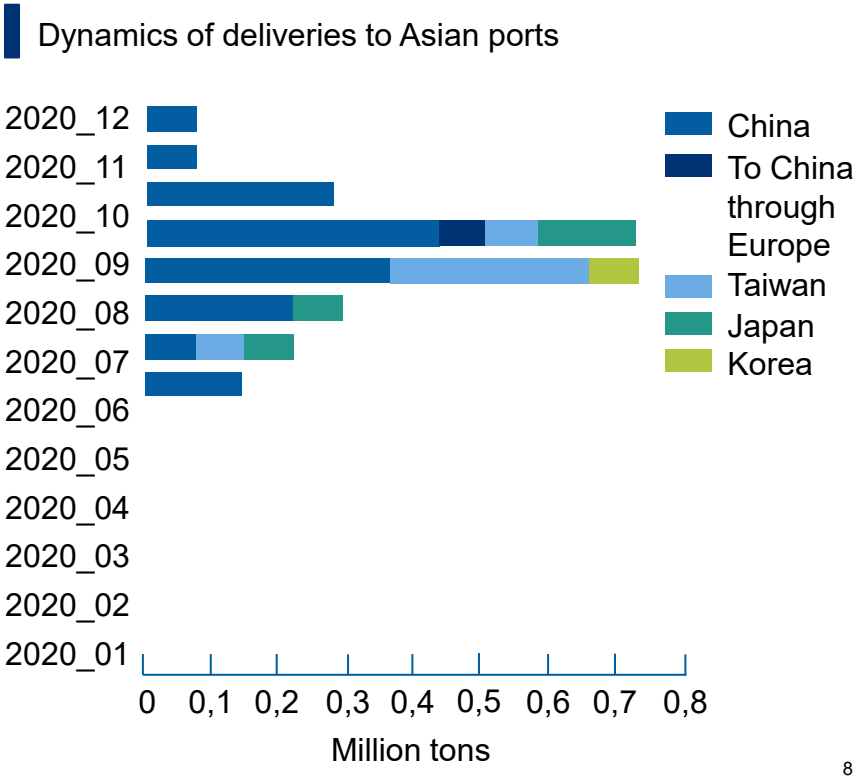
The circle area is proportional to amount of deliveries.



Direct LNG supplies to the Asian markets in 2020



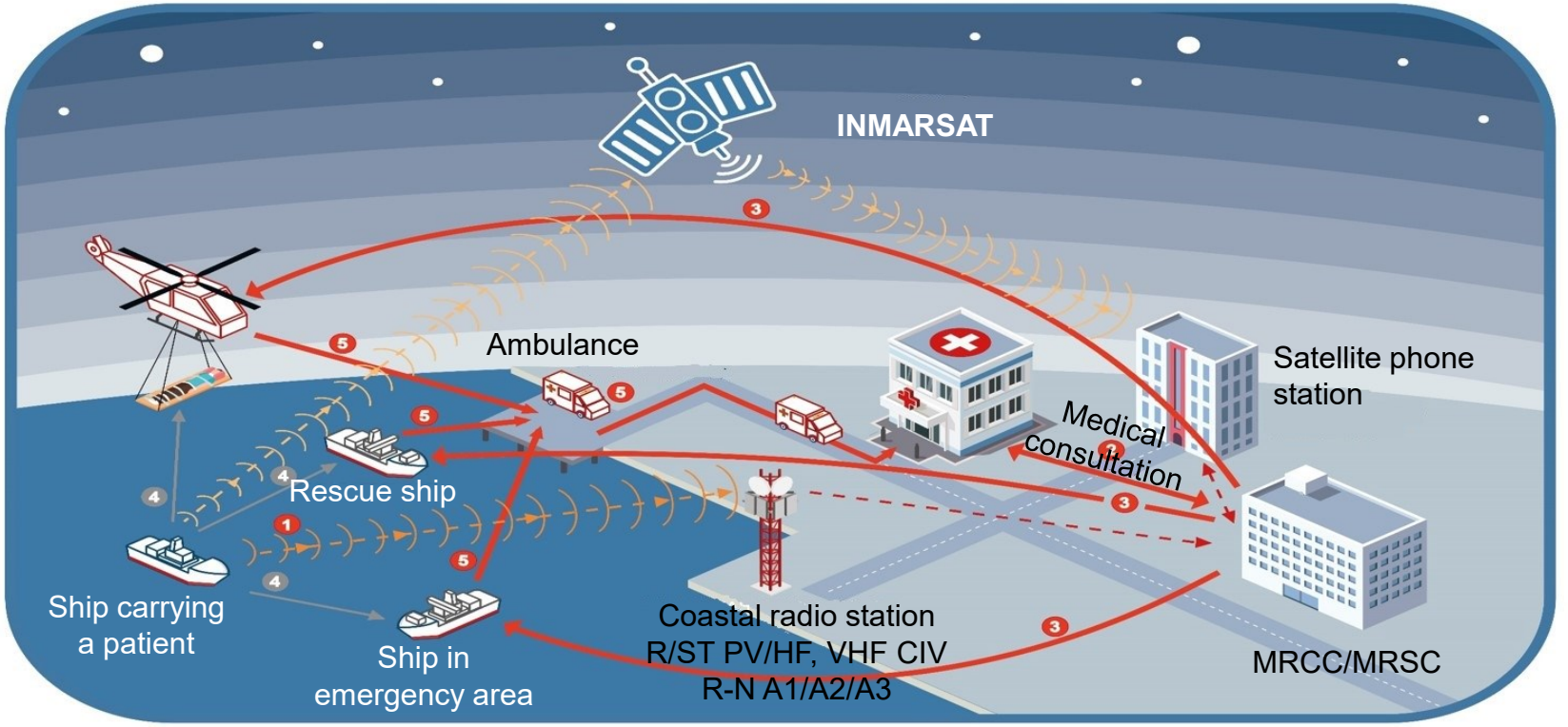
The circle area is proportional to amount of deliveries.



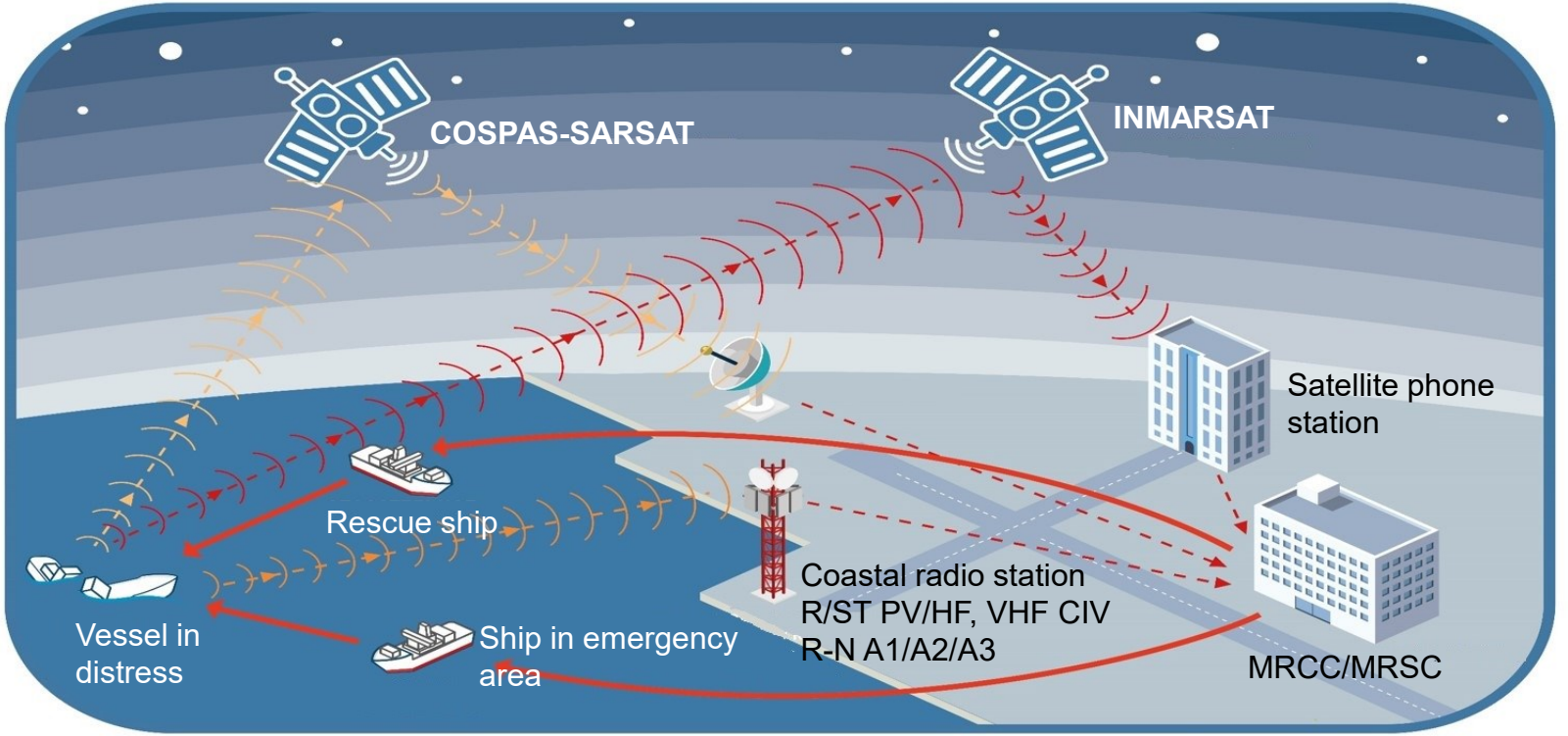
2.

Safety of shipping on the Northern sea route

Arrangement of medical emergency evacuation on the sea



Arrangement of search and rescue operations on the sea



Development of new nuclear power icebreaker fleet

- Nuclear power icebreaker fleet **in operation**: “Arktika”, “50 Let Pobedy”, “Yamal”, “Taymyr”, “Vaygach”.
- Construction of four icebreakers of 22220 project **has been started**: “Sibir”, “Ural”, “Yakutiya”, “Chukotka”.
- Construction of the lead icebreaker “Lider” of 10510 project **has been started**.

The lead nuclear-powered icebreaker "Arktika” Project 22220 of LK-60Ya type

The lead nuclear-powered icebreaker "Lider” Project 10510 of LK-120Ya type

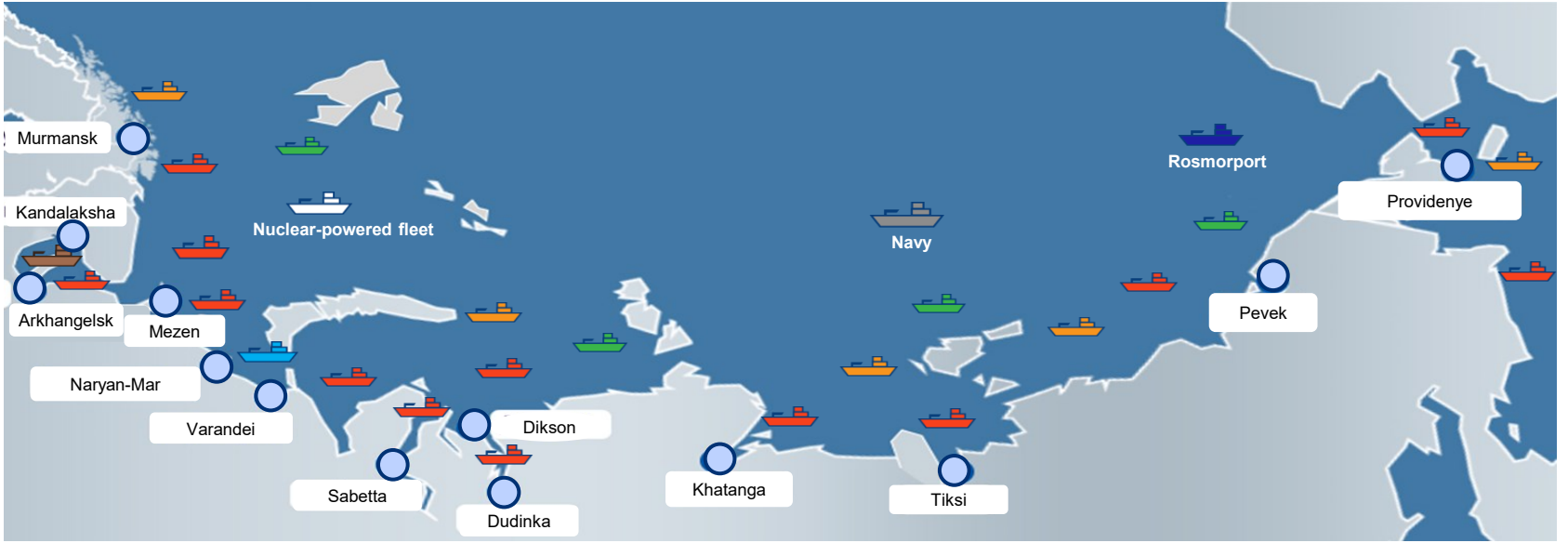
Nuclear-powered icebreaker as a versatile rescue vessel

- Data collection and evaluation of environmental situation in NSR waters
- Submission of information relating to location of rescue and medical services
- Bringing rescue and salvage ships to the accident site
- Equipment for oil spill response
- Advanced medical unit
- Helicopter pad
- Diving equipment

Development of new emergency rescue fleet

In 2021, construction of **16 new various rescue vessels** shall be started, and they shall begin to perform emergency rescue activities in **2023-2025**.

Deployment of rescue vessels in the Arctic in 2024



MFASS 7 MW Icebreaker6	**4 unit**	Rescue and fire-fighting tugboats	**13 units**
MFASS 3-4 MBт Arc5	**5 units**	MFASS 18 MW Icebreaker6	**1 unit**
MFASS 2.5-3 MW Arc5	**1 unit**		

Hydrographic survey of the Arctic ocean

Before **2024**, according to international standards, the Federal State Unitary Enterprise "Hydrographic Enterprise" shall survey about 300,000 km of the bottom relief in NSR water area

- Retrofit of hydrographic vessels — **3 units**
- Construction of hydrographic vessels — **3 units**
- Construction of buoy-laying vessels — **2 units**

Construction of hydrographic vessel of Arc7 ice class, project HSV05.02 9 (1 unit).

Construction of hydrographic surveying motorboats of Ice 3 ice class, project aE.35G (2 units).

Renovation of hydrographic vessels (3 units): Grigory Mikheev, Petr Kottsov, Alexey Maryshev

Construction of buoy-laying vessel of Ice 3 ice class, project BVL03 (2 units)

Development of ShMO for NSR shipping contriol

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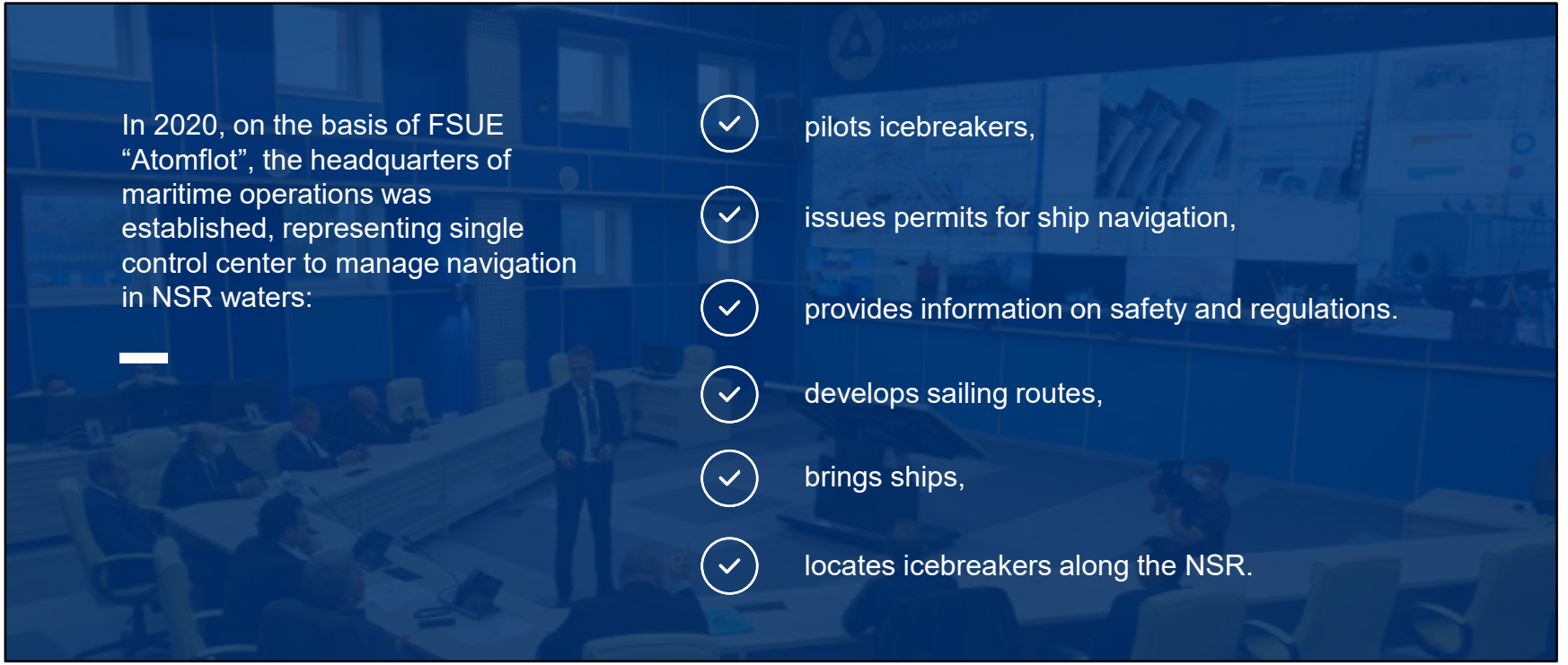
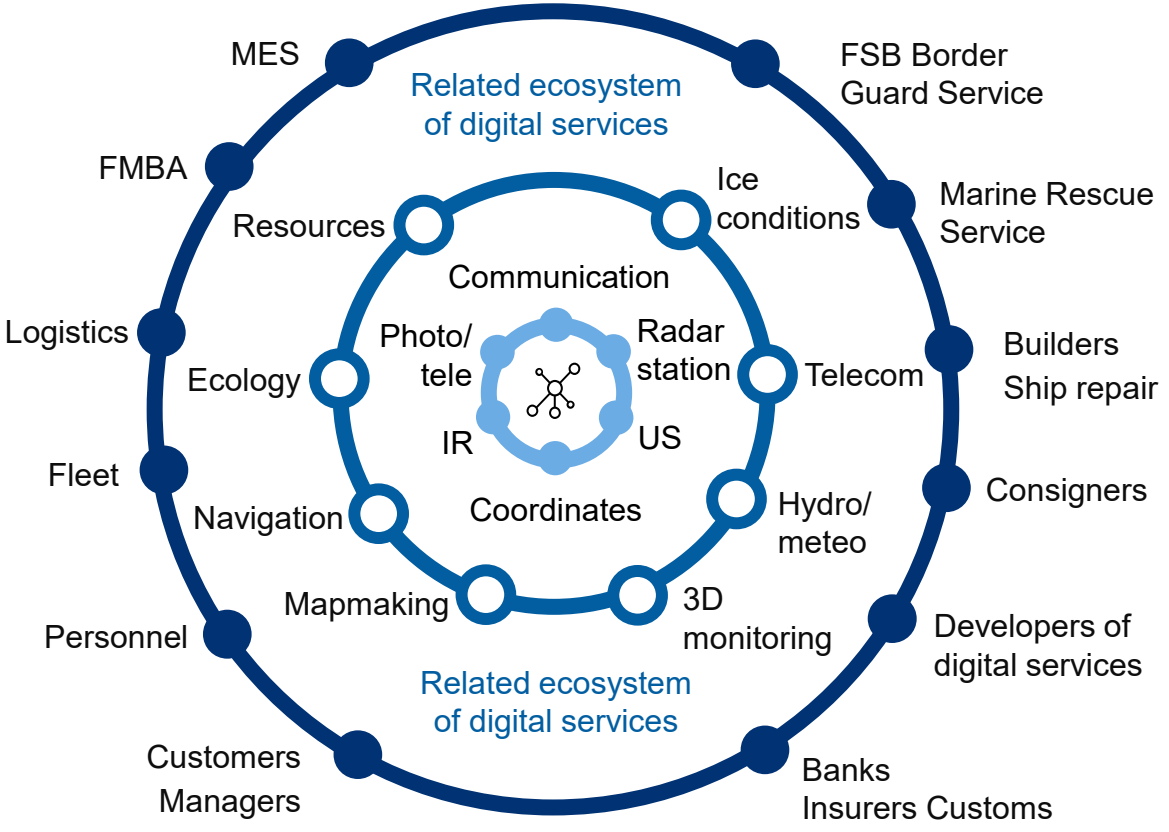


In 2020, on the basis of FSUE “Atomflot”, the headquarters of maritime operations was established, representing single control center to manage navigation in NSR waters:

- pilots icebreakers,
- issues permits for ship navigation,
- provides information on safety and regulations.
- develops sailing routes,
- brings ships,
- locates icebreakers along the NSR.

Develops single platform for NSR digital services



Structure of digital services ecosystem D33

Target equipment of satellites, unmanned aircrafts and ship equipment. Data acquisition toolkit D33 photo/tele, radar, communication, US, IR, coordinates

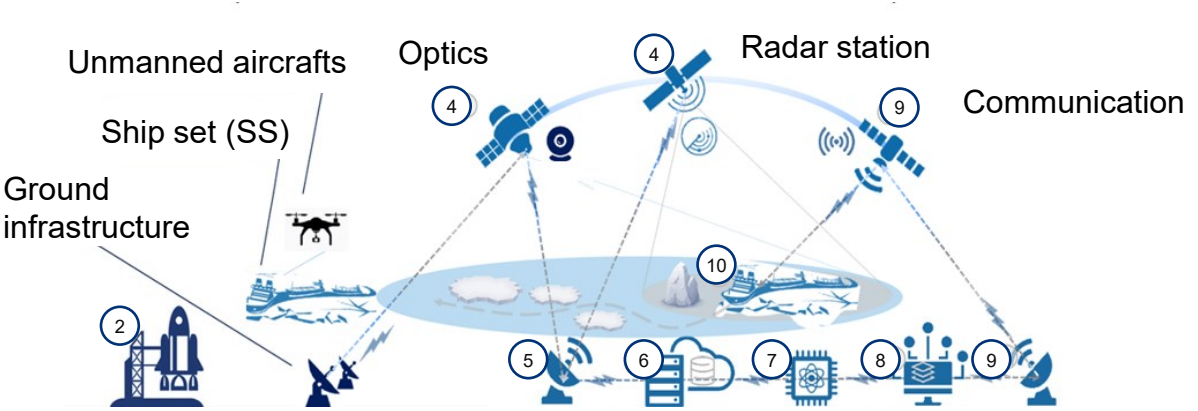
Ecosystem of digital services

Set of services based on target hardware and digital platform technologies including artificial intelligence

Ecosystem of service consumers

A system of different consumer groups united by a single target goal or habitat

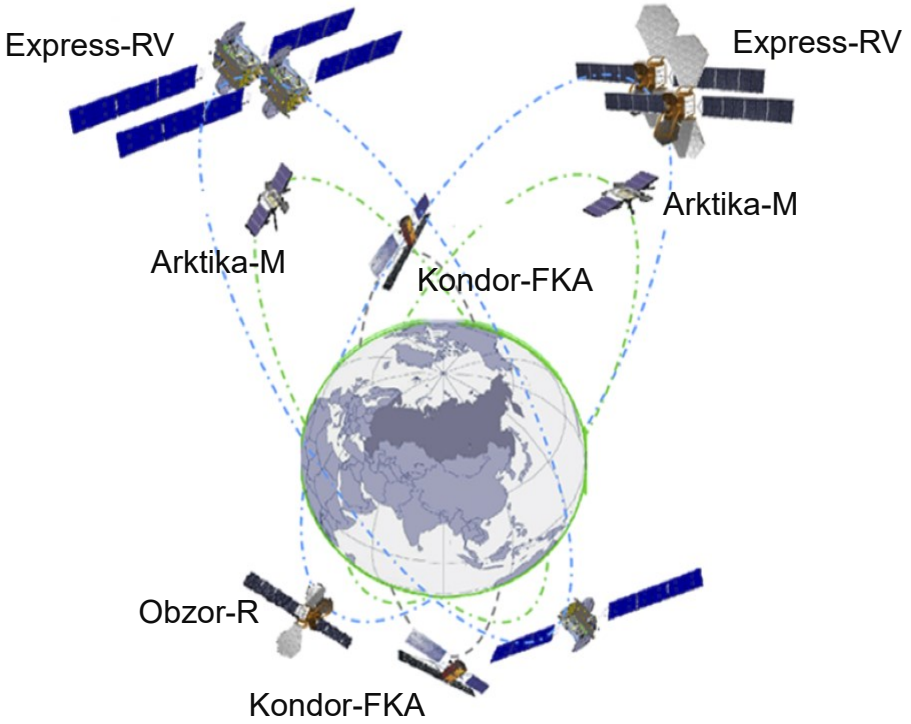
Development of ice routing system and predictive model



Unified digital arctic services platform

1. Space infrastructure
2. Launch of spacecraft (launch vehicle)
3. Air, ship and ground infrastructure
4. Reconnais-sance from SS, SC and unmanned aircrafts
5. Data receiving and data transmitting
6. Data collection and data storage
7. Data processing (computing power, software, algorithms)
8. Analytics, sustainable shipping support
9. Data communication to users
10.

Development of satellite systems for the Arctic: communications, D33 and meteorology



Kondor-FKA and Obzor-R station

Kondor-FKA – 3KA: for radar survey of the earth and ice coverage

Obzor-R: for radar survey of the earth and ice coverage

Express-RV station

Express-RV - 4KA: In highly elliptical orbits it helps to solve communication and Internet problems in northern regions of Russia including Arctic region

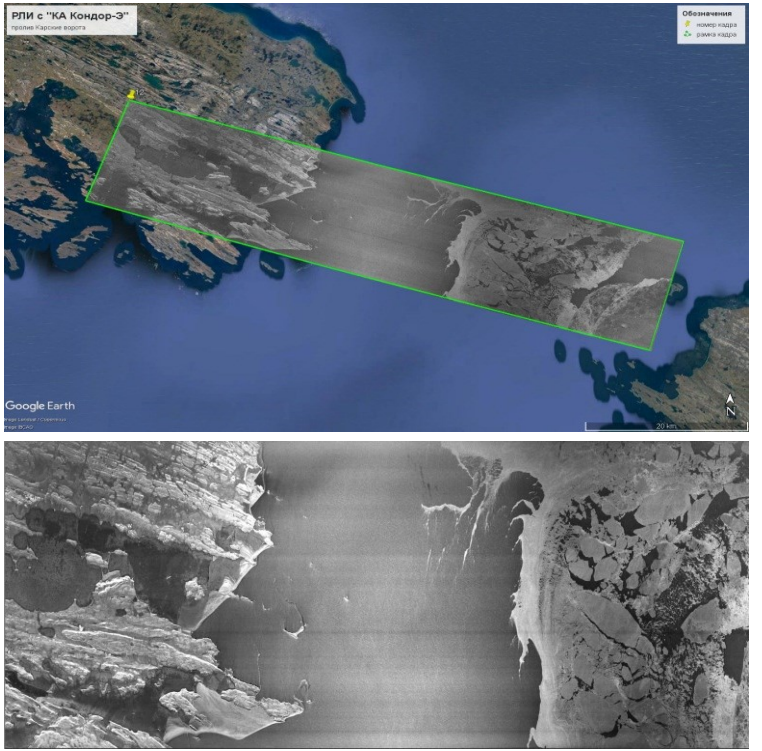
Arktika-M station

Arktika-M – 2KA: For meteorological monitoring in highly elliptical orbits with apogee altitude of 40,000 km

Processing of ice coverage radar images

Ice cover characteristics required to ensure safe and sustainable shipping:

- Fast ice boundaries
- Ice age
- Ice shape and size of ice formations
- Ice leads and channels
- Ice reefing
- Iceberg position and iceberg size
- Detection ship in the ice
- Ice consolidation
- Ice drift
- Ice compaction
- Ice thickness



Experimental super late voyage on NSR

Thank you
for your attention

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