Evolution trends of data centers and clouds

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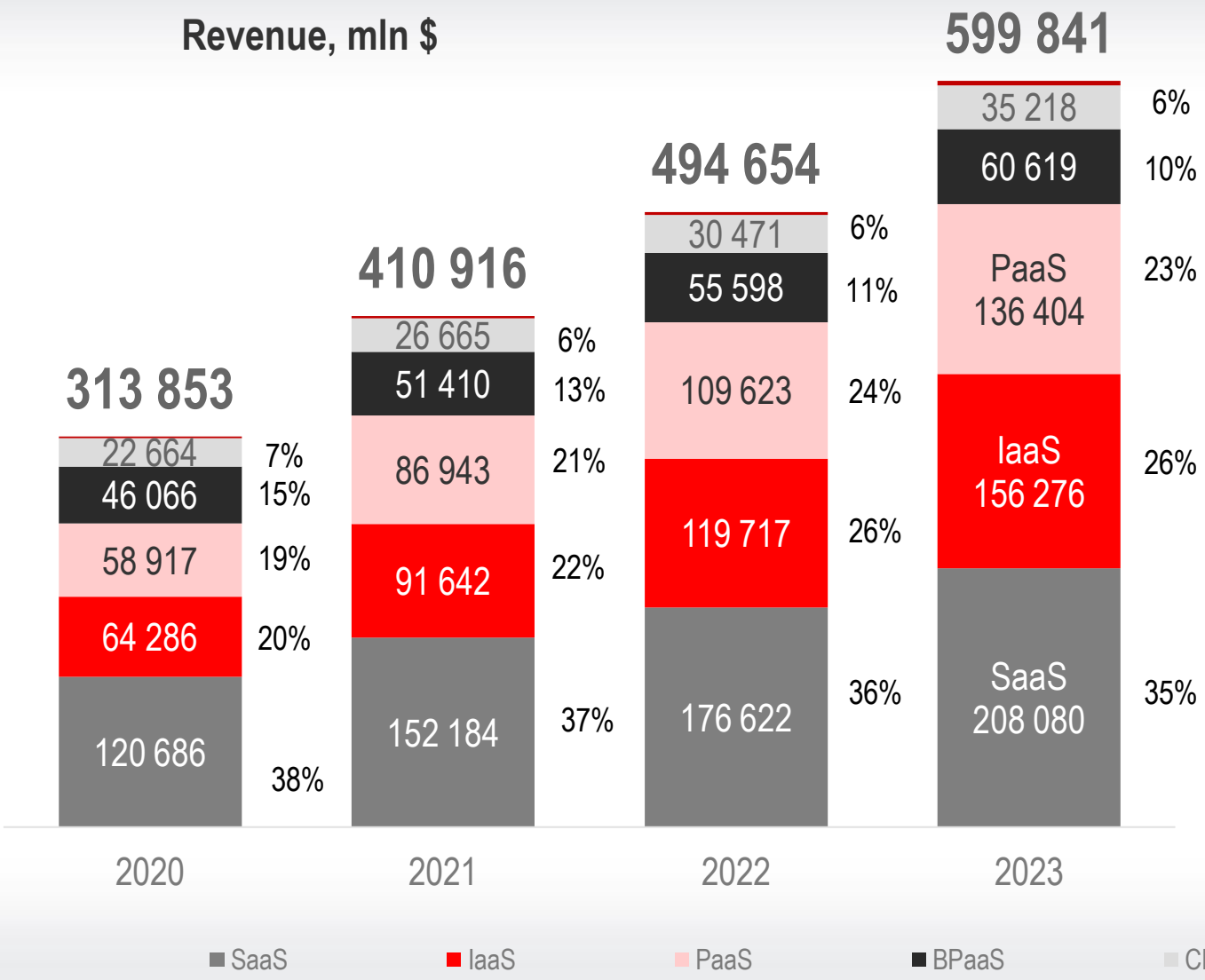
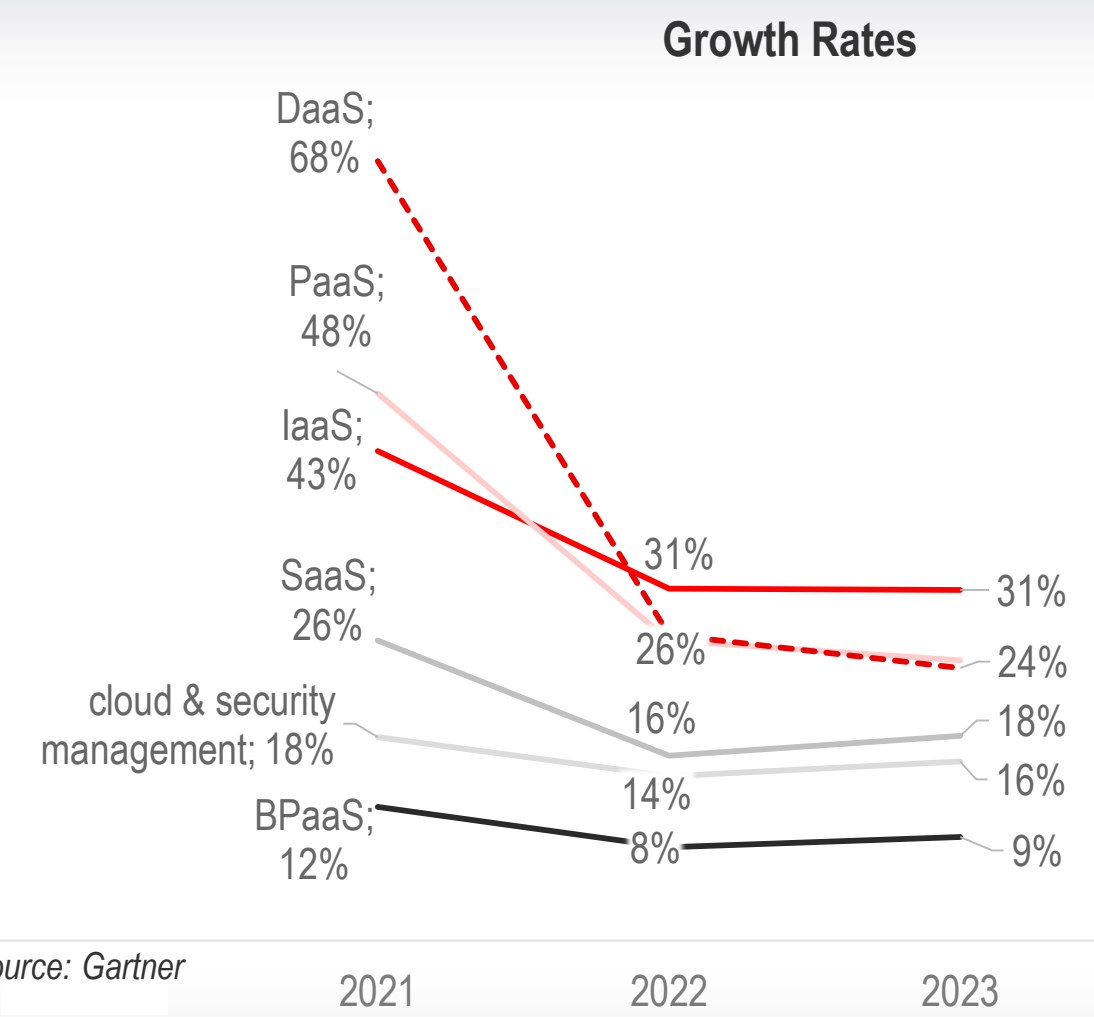
Global Spending on Public Cloud 2023





Source: Gartner

Cloud Market is Flourishing

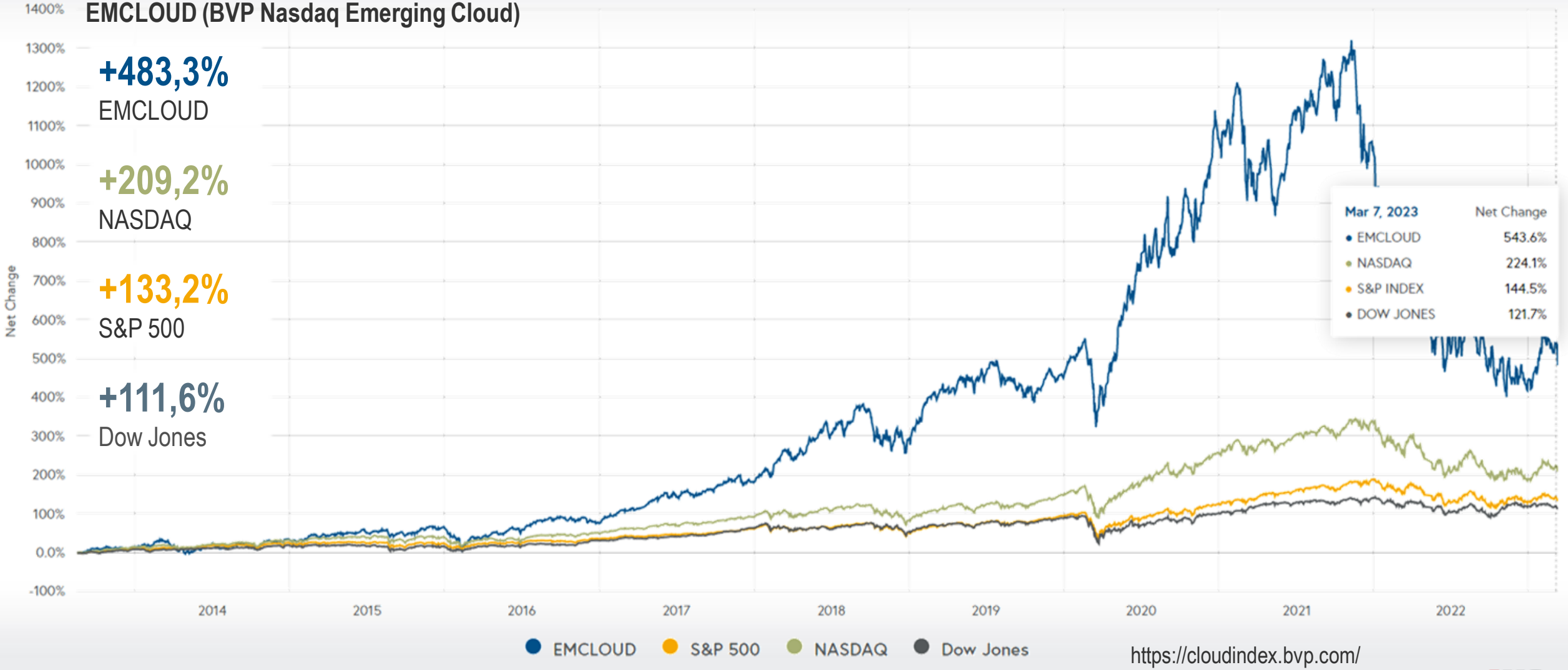
Indexes of high-tech companies – NASDAQ and EMCLOUD (BVP Nasdaq Emerging Cloud)

+483,3%
EMCLOUD

+209,2%
NASDAQ

+133,2%
S&P 500

+111,6%
Dow Jones



https://cloudindex.bvp.com/

Investing in Data-Center Economy

M&A in Data-Centers

Year of purchase	Transaction object	Acquirer	Proportion of shares	Transaction amount, mln USD	Revenue, mln USD	EBITDA , mln USD	EV / revenue, x	EV/ EBITDA, x
2020	GPX Global Systems Data Centers	Equinix	100%	161	н/д	11	н/п	14,6
2019	InterXion	Digital Realty Trust	100%	8829	684	322	12,9	27,4
2018	Asia Pacific Data Centre Group	NextDC	70,8%	132	45	н/д	4,1	n/a
2017	Metronde Group	Equinix	100%	791	40	н/д	19,8	n/a
2017	Itconic	Equinix	100%	259	49	18	5,3	14,4
2017	Asia Pacific Data Centre Group	NextDC	24,6%	41	28	н/д	5,9	n/a
2017	DuPoint Fabros Technology	DB	100%	7286	567	304	12,9	24,0
2017	Santinel Data Centers (DC2)	Cyrus one	100%	490	н/д	34		14,4
2016	Global Switch	Elegant Jubilee	100%	4062	255	177	15,9	22,9
2015	Telecity Group	Equinix	100%	4256	527	219	8,1	19,4
2015	Carpathia Hosting	QTS Realty Trust	100%	326	19	н/д	17,2	n/a
2015	Cervalis Holdings	Cyrus one	100%	400	7	н/д	57,1	n/a
average							**16,0**	**19,7**
median							**12,9**	**19,6**

CHARACTERISTICS OF THE INTERNATIONAL DC MARKET

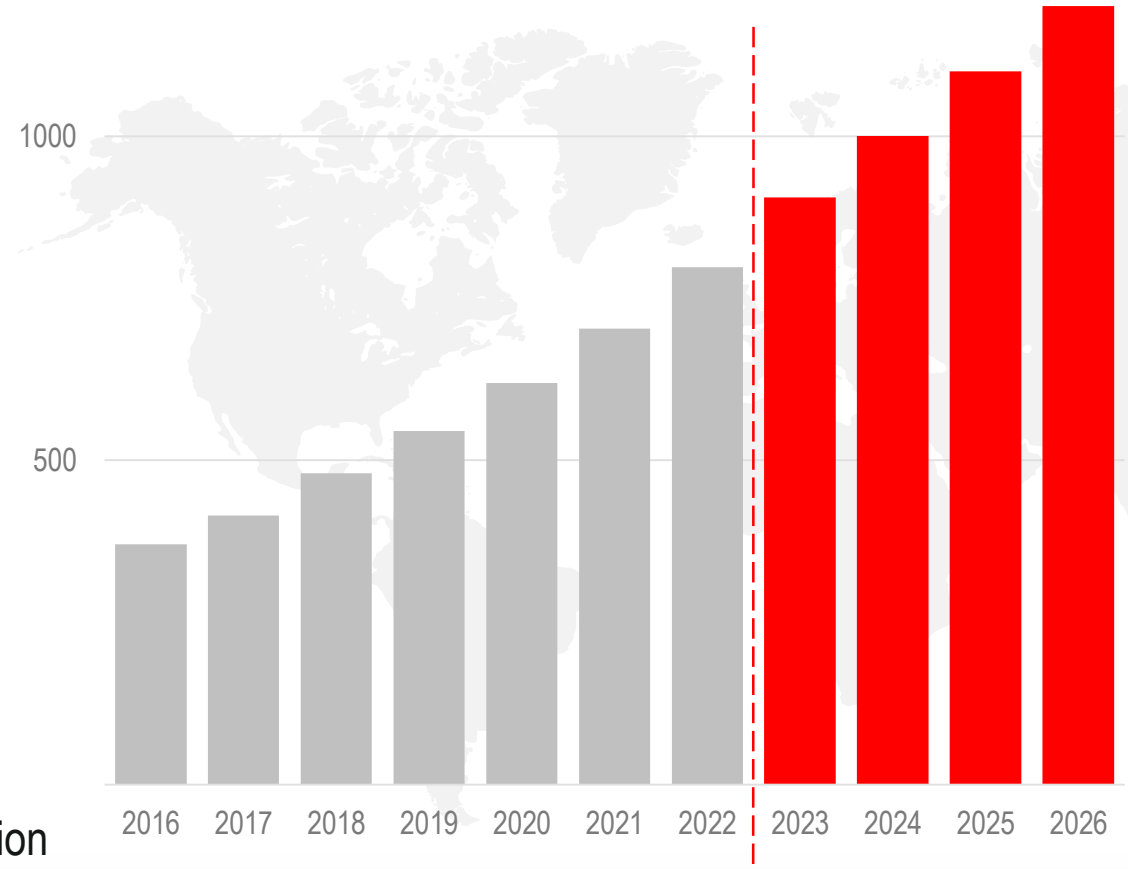
KEY TRENDS

A sharp increase in market concentration

Reformatting the rules of international trade

Regionalization of the Internet, tightening of cross-border data circulation

Number of HYPERSCALE DCs*



USA
CHN
IRL
IND
ESP
ISR
CAN
ITA
AUS
GBR

* Data center with a capacity of 40 MW / 5000+ servers, ~ 1 thousand m^2 is considered as hyperscale

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Growth of Information Security Threats

Migration to private cloud

On-premise occupy their niche for especially critical applications and services

More control over infrastructure

HaaS-solutions are actual in context of risk of outages

Requires more expertise

ADDITIONAL REQUIREMENTS for network connectivity

Additional elements of information security

- NGFW
- Crypto gateways
- Intrusion prevention systems

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Strategies for Building Network Connectivity in Hybrid Infrastructures

Marketplace strategy

One provider for the entire range of services, including responsibility for building network connectivity service.

ADVANTAGES

- One-stop shopping mode
- Ability to use all the possible ecosystem services already integrated with each other
- Beneficial for major market players

DISADVANTAGES

- Individual services of a complex service work within a single and interconnected engineering system
- The need to adapt the internal architecture
- Not all the required services may be implemented

Cloud integrator / data center

Provides services and acts as an integrator for the customer's IT department.

ADVANTAGES

- Ability to use a variety of services
- Distribution of services across different domains
- Maximum flexibility of architectural solutions

DISADVANTAGES

- Additional costs for design and implementing connectivity between different service providers
- Interaction with various service providers

Source: Oxygen

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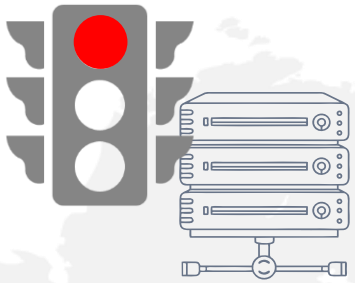
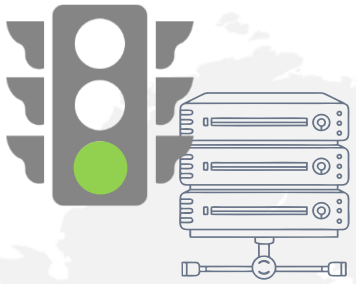
CONSTRAINTS OF DC AND CLOUD PROVIDING MARKET DEVELOPMENT IN EURASIA



- Low level of competition
- Monopoly of government-owned telecom operators
- High cost of the internet
- Low level of use of public infrastructure by government agenesis
- Low motivation for switching to outsourcing => small volume of demand

CRITICAL CONDITIONS FOR A BREAKTHROUGH OF DATA CENTERS MARKET IN EURASIA



1. Creating an enabling environment for private investments into digital infrastructure

2. Formation of domestic demand for data storage and processing services

3. Ensuring equal access of market players to the connectivity infrastructure