

2023

Universal  
registration  
document

20

YEARS

of open, trusted and  
innovative network  
connectivity

Connect the future

 ekinops®

# 2023 REVENUE

€129.1<sub>m</sub>

**68%** revenue  
generated by  
international markets

EBITDA  
€18.6m

**3**

BUSINESS

- OPTICAL TRANSPORT OVER FIBER
- DATA & VOICE ROUTERS
- SOFTWARE DEFINED



> 500

EMPLOYEES



54%

ENGINEERS IN R&D



23%

REVENUE INVESTED IN R&D



# Open, trusted and innovative network connectivity

Ekinops is a leading supplier  
**of innovative, open, and interoperable**  
solutions for telecommunications  
networks.

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FY 2023 **18**



Preparing Ekinops to seize growth opportunities as soon as our markets recover.

## INTERVIEW WITH DIDIER BRÉDY

Chairman and Chief Executive Officer

**Ekinops reported slight growth in its business in 2023, a year hit by a genuine trend reversal mid-year. What were the reasons for this?**

After a particularly dynamic 2022, with growth of 23%, we continued to enjoy steady business over the first half of the year, reporting growth of 12%.

The trend reversed during the summer of 2023, owing to the economic slowdown, in particular our Access business line which had to deal with the greater wariness of order givers in terms of investment, and high inventory levels at our customers as well as more expensive access to financing for telecom operators owing to the increase in interest rates.

Nevertheless, it should be noted that business was very dynamic for our Optical Transport equipment in 2023 (+27%), in particular our WDM solutions driven by numerous commercial successes and new customer wins, on the back of increasing demand for bandwidth from operators.

All told, Ekinops generated slight growth in 2023 (+1%), with an impressive performance in key markets in EMEA (excl. France) (+23%) and in North America (+10%).

**In recent years, you announced your desire to increase the portion of software in your offering. What was the result of this strategy in 2023?**

Ekinops is a pioneer in virtualization technologies which enable the decoupling of software and physical platforms. In a telecommunications market undergoing change, our desire is to continue to offer operators and suppliers software that is increasingly compatible with our equipment (SD-WAN, network function virtualization, Edge computing, etc.) to make our solutions ever-more innovative, open and interoperable.

This strategy was reflected in our numbers: the portion of Software & Services business increased 12% in 2023, to make up 17% of total business for the year, and, for the first time, more than 20% during the second half of 2023.

Therefore, we are clearly on track to reach our ambition of 20-30% of business from Software & Services.

### **2023 financial results reflect the relative resilience of Ekinops' business model in an adverse market environment...**

Despite the trend reversal during the second half of the year, our gross margin held up well in 2023 (52.1%), reflecting our pricing power thanks to the added value contributed by our solutions.

In 2023, Ekinops chose to maintain the majority of its investments, notably with net hires of close to 50 employees, to prepare for future growth as soon as our markets recover. As a result, our EBITDA margin stood at 14.4% versus 17.7% a year earlier, which was a record level.

Beyond the resilience of our profitability, we must also mention Ekinops' ability to generate cash flow from operations: operating cash flow came to €13.5m in 2023, up 44% compared with the previous year, and free cash flow reached a record €5.3m.

Buoyed by this strong cash generation, our available cash amounted to €47.2m at end-2023 and our net cash came to €25.8m.

### **Beyond financial results, Ekinops has implemented a genuine policy in terms of sustainable performance. What were the main areas of progress in 2023?**

As part of our CSR policy, we continued to strive to minimize the environmental impact of the equipment we sell and the processes involved in manufacturing them. In 2023, we notably finalized the lifecycle analysis of equipment representative of the Access range to identify the impacts of products at each stage of the value chain.

Similarly, we are committed to a trajectory to reduce our CO<sub>2</sub> emissions, and our Bilan Carbone® 2023 reflected a 40% decline in absolute terms compared with 2022.

At the societal level, last year we published our first CoP (Communication of Progress), which shares the progress achieved by Ekinops in the implementation of the Ten Principles and the contributions made in reaching the 17 SDGs (Sustainable Development Goals) of the United Nations Global Compact.

Lastly, in terms of human resources, we continue to strive to increase the representation of women in our workforce, with an increase of 15% of women workers which now account for 21% of Group employees.

### **A word for the future: how is 2024 looking so far?**

As I mentioned, the second half of 2023 suffered from an economic slowdown and uptrending interest rates impacted investment policies and the financial health of companies. On a par with the last months of 2023, 2024 started off with a stabilized market, but is not yet showing signs of recovery.

We are likely to see a rebound in Access equipment sales during the year, as the effects of the economic recovery impact companies. In terms of Optical Transport, in the summer we will launch a major new product, doubling the capacity of our optical connections, which should contribute to strong business trends in 2024.

Lastly, although we did not manage to carry out an external growth transaction in 2023, we remain mobilized to confirm one or more acquisitions to extend our R&D and round out our customer base. We also plan to leverage our financial strength and favor a non-dilute approach to financing.

## BUSINESS

### Open, reliable and innovative network connectivity

Ekinops' mission is to provide open, reliable and innovative network connectivity solutions. Ekinops aims to contribute to the success of its customers thanks to the design of high value-added solutions.

### ENHANCING TELECOM AND CORPORATE NETWORKS

Ekinops is a leading supplier of open, interoperable telecommunications solutions for service providers (telecommunications operators and companies) around the world.

Ekinops' solutions, which are highly programmable and scalable, enable rapid and flexible deployment of new high-speed and high capacity optical transport services (Ethernet services, IP voice and data routing, etc.) from physical and virtual platforms.

Ekinops offers efficient, optimized and highly flexible solutions. They can be closely tailored to meet specific needs in the operators' network core and in the offices of businesses both large and small.

Ekinops participates in the success of its customers by providing them with high value-added equipment, software and services.

### A PARTNER OF TRUST

Ekinops is a genuine partner with its customers. In this way, operators can count on the Group for the design and optimization of their networks. A genuine difference for them, with a major positive impact. Equipment is preconfigured/tested for installation/integration in plug and play mode. Performance at a reasonable price is also unequalled. Thanks to our software, the equipment required for a given level of performance is lighter and less costly. The customer relationship with Ekinops is collaborative and based on simple and open solutions: no proprietary blocking mechanisms, third-party integrations, etc.

### OPTICAL TRANSPORT, DATA AND VOICE ROUTER AND SOFTWARE-DEFINED SOLUTIONS

Ekinops' portfolio of solutions and services consists of three fully complementary brands:

- EKINOPS360** High-capacity optical transport and OTN switch solutions
- ONEACCESS** Data and voice router solutions
- COMPOSE** Software-defined solutions

Ekinops (EKI) has been listed on Euronext in Paris since 2013. Its head office is located in Lannion (France). The Group is represented in more than 10 countries around the world.

The Group was founded by two telecoms engineers who hold 15 patents in optical transmission, the innovation that lies at the heart of the Group's strategy.

Every year, Ekinops invests more than 20% of its revenue in research and development (R&D). More than 50% of the Group's 500 employees work at Ekinops's multinational R&D hubs in Lannion, Sophia-Antipolis, Massy (France), Campinas (Brazil), Louvain (Belgium), Geneva (Switzerland) and Bangalore (India).

The Group is a virtualization pioneer and is developing solutions to support the transformation of networks into software-defined and highly scalable networks.

As service providers embrace SDN (Software Defined Networking) and NFV (Network Functions Virtualization) deployment models, the solutions designed by Ekinops allow them to migrate transparently to open, virtualized architectures.



# the future

## MAKING THE NETWORKS OF TOMORROW TODAY

### 2023: A YEAR OF MANY CHALLENGES FOR Ekinops

2023 represented new challenges to tackle a deteriorated market environment. Indeed, the year saw a global economic slowdown and a decline in demand, notably for the Access range, stemming from high inventory levels of equipment at major operators and more difficult and costly access to financing.

The excellent agility of our Group nevertheless enabled us to take advantage of strong demand for operator bandwidth supporting the Optical Transport business line. Buoyed by numerous commercial successes and new customer wins, notably in North America, this business line enjoyed 27% growth over the year.

In the network access market, Ekinops after obtaining the Microsoft Direct Routing certification for Teams and its SBC (*Session controller/Session border Controller*) in 2022, makes it available on the Microsoft Azure marketplace. In this way, service suppliers can more easily design their voice services targeting corporate customers. Still in 2023, Ekinops markets the first industrial routers based on the OneOS6 system (unique EAD middleware/routers) including the "FlexCPE" functionality. These products offer the possibility of loading and running third-party applications in the form of containers. Compared with Cloud usage, this enables faster response times, better confidentiality and a reduction in the carbon footprint and cost of use of data centers.

In the "Compose" activities, Ekinops continued its SD-WAN deployments, by increasing the number of sites served and continued to prove the value of its OVP suite for virtualization projects at operators. At the level of edge computing, the SixSq marketplace has been expanded to offer multiple applications to different vertical businesses.

In Optical Transport, where annual sales exceed targets set, 2023 saw numerous commercial successes, both in the United States and in Europe with, notably, at the end of the year, a multi-year contract with German operator Deutsche Glasfaser to modernize and unify their optical transport network based on the Ekinops360 platform, or with regional network projects serving rural communities in Utah and Colorado. At the same time, the Group continued to market its coherent module based on add-on 400G interfaces, to offer less expensive and lower energy consumption solutions than currently existing high-performance embedded optical technologies.

2023 saw double-digit growth in sales of services. These services include SLA (Support Level Agreements), equipment support (guarantee extensions) and professional services such as technical assistance for virtualization (integration for virtualization, for example). The constant progression in the related services and software component indicates that operators are continuing to seek out the expertise and assistance of Ekinops for the deployment or update of their networks.

All Ekinops' solutions, equipment and software are operator class, and are intended to help service providers and businesses address network evolution and the constant demand for greater capacity and agility.

In short, Ekinops empowers next-generation networks.



**Frank Dedobbeleer**

Chief Revenue Officer, EMEA & APAC

"Service providers who invest in extending their digital capacities in their regions of the world, from major urban centers to the smallest communities, can count on Ekinops' solutions to offer the technological and economic basis to enable them to reach their targets.

We are proud to be the strategic partner of many operators throughout the world."

# EKINOPS IS NOW SUCCESSFULLY SELLING ITS SOLUTIONS TO THE TOP 30 TELECOM OPERATORS WORLDWIDE AND TO MORE THAN ONE-THIRD OF THE TOP 100.

*(Source: Total Telecom Top 100 operators Business Analysis – 2019)*

## MARKETS

### STRONG GROWTH MARKETS

Ekinops operates on very fast-growing markets, driven by the deployment of new networks and the rise in capacity of existing networks, supporting fundamental trends such as mobility, hybrid working, the Cloud, Edge Computing, connected objects, to name but a few.

With bandwidth consumption rising steadily around the world in view of new uses – (5G, OTT services, IoT (Internet of Things), mobility, etc.) – there is a mechanical increase in optical transport and network access markets.

Thanks to its voluntary and ambitious innovation policy enabling the deployment of efficient and optimized solutions, Ekinops has managed, since its creation, to enjoy steady growth and gain market share.

Despite having generated a significant portion of revenue (€68.6m in 2023) in international markets, Ekinops is still of relatively modest size in markets dominated by a few multinationals.

Ekinops' main competitors on the optical transport market are the equipment manufacturers Ciena, Huawei, Nokia and Adva (part of the Adtran group since mid-2021). In Access, its main rivals are Cisco, Huawei, Juniper and Adtran.

Upheavals in the macroeconomic backdrop in recent years, between the pandemic and the electronic component supply crisis and tougher access to financing, have exerted pressure on supply in strategic sectors including the telecommunications sector.

Ekinops' French identity, its control of its supply chain and its agility in terms of sourcing and management of inventories are genuine strengths to attract operators who must ensure they find partners they can trust.

Via its OneAccess brand, Ekinops currently ranks third worldwide in the Branch Office equipment market.

*\*Source: Omdia - Enterprise Routers Market Tracker – Data.*



# INNOVATION - R&D

Every year, Ekinops invests more than 20% of its revenue in research and development to provide its customers with innovative solutions to keep up with technological and competitive developments in the telecommunications market.

Operators must constantly adjust their offerings to ever-changing demand and the powerful competition of players like GAFAM. They must also meet ever more demanding environmental criteria, notably in terms of energy consumption.

Service providers are continuing to accelerate their transition, and the Group is investing to provide them with the solutions required to shape their transformations, notably in areas of automation, SDN (Software-Defined Networks), virtualization and Edge Computing), while integrating reflection and actions so that these technologies form part of a sustainable development approach.

The Group is largely involved in institutional research projects at an international level enabling the integration of experts (doctorate/PhD profiles, for example) and to envision the innovations of tomorrow. This involvement is an illustration of the Group's desire to build an open ecosystem.

## 5G INVESTMENT DRIVERS

5G should lead to a 10x surge in capacity between 2018 and 2025 and will require huge capex investment. The promise is significant: at least 10 times more traffic/capacity, a 10-fold reduction in latency and a significant increase in connection density. Ekinops is working with its operator partners to make 5G a backbone network that can carry enterprise connectivity services (WAN).

## CLOUD AND SECURITY

Most companies adopt a Cloud first approach when deploying new applications. Gartner affirms that 85% of organizations will be Cloud first by 2025, and operators appear to confirm this trend. The Group is constantly

investing to enhance its software competencies (agility, DevSecOps) to make its software offering more Cloud-native. The same is true for issues of safety: Ekinops invests heavily to reduce the vulnerability of its products throughout their life cycle (design, development, testing, operation, maintenance).

## EDGE

The access network functions, now performed by physical platforms (CPE), are becoming virtualized functions and will soon be microservices at the network edge. Critical applications or those sensitive to latency time are moving closer to businesses and Internet users to take full advantage of new cloud-distributed functions and services. Ekinops is investing in this high-growth segment and will offer software to service providers to help them perform services on the edge (expansion of OneOS6). The SixSq portfolio fits into this strategy, notably the Nuvia.io marketplace which enables easy deployment of business applications.



**Sylvain Quartier**

Ekinops Marketing CEO

"Ekinops has been offering network access solutions to service providers for some time. By working daily with them, we recognize the enormous opportunities but also the challenges related to virtualization, in particular in terms of return on investment. Leveraging our experience, we continue to combine our technologies, to not only ensure shorter time to market but also a faster return on investment. Virtualization at the edge of networks has long been a goal for many operators, and solutions are now emerging. The cost savings and environmental benefits linked to the possibility of executing several services on a single device will therefore materialize."

# INTERNATIONAL

Ekinop was founded in 2003 in Lannion (France), the cradle of French telecommunications. It is proud of its French and European identity and manufacturing. But with more than 65% of its business generated from international markets, the Group has a truly global footprint and strong international experience.

Ekinops' headquarters are located in Lannion (France), which is also home to its optical transport R&D acti. The Ekinops Group has 10 subsidiaries throughout the world: Ekinops France located in the Paris region at Massy (France), Ekinops Corp in Rockville (Maryland) in the United States, Ekinops Brasil located in Campinas in Brazil and other entities in Germany, Spain, Australia, India, Canada and Belgium. Ekinops' research and development activities span seven R&D sites: five in EMEA (Lannion, Sophia Antipolis, Massy, Louvain and Geneva), one in Brazil (Campinas) and one in India (Bangalore). Apart from its R&D centers, the Group has overall sales representation in more than 10 countries, including Sweden, Poland, Russia, the United Arab Emirates, Kenya, Kazakhstan and the United Kingdom.

Thanks to its global presence, Ekinops provides support services to its customers worldwide and boasts customers in more than 70 countries.

The Group also has a manufacturing, assembly and repair plant in Louvain (Belgium).

Currently, more than 120 international service providers, including many tier 1 operators around the world, rely on the Group's staff and technologies to help them with their infrastructure, provide enterprise managed services to their customers and facilitate the migration to virtualized networks.



**Kevin Antill**

Chief Revenue Officer, North America

“Our growth in 2023 reflects the success of Ekinops internationally. We will continue to build on our positions in North America which is the leading region for Ekinops for sales of its Ekinops360 Optical Transport platform. Over the past three years, Ekinops has doubled its customer base and reported strong revenue growth (10% in 2023 in USD) n the region.”



## EXECUTIVE COMMITTEE



**Didier Brédy**

Chairman and CEO



**Dmitri Pigoulevski**

Group Chief Financial  
Officer



**Philippe Moulin**

Director of Operations



**Sylvain Quartier**

Ekinops Marketing CEO



**Kevin Antill**

Chief Revenue Officer  
North America



**Frank Dedobbeleer**

Chief Revenue Officer  
EMEA & APAC

## GOVERNANCE

# THE MANAGEMENT TEAM IMAGINES AND EXECUTES THE VISION AND STRATEGY OF EKINOPS.

The main role of the Board of Directors is to adopt the major strategic orientations and ensure that they are implemented.

It is made up of six members:

- Didier Brédy, Chairman;
- François-Xavier Ollivier, co-founder of Ekinops;
- Bpifrance, represented by Charlotte Corbaz;
- Aleph Capital, represented by Hugues Lépïc;
- Nayla Khawam, independent director;
- Lori Gonnu, independent director.

The Board of Directors created four Special Committees:

- The **Audit Committee** is composed of two members: Nayla Khawam (Chair) and Charlotte Corbaz, as representative of Bpifrance Participations SA;
- The **Remuneration Committee** is composed of three members: Hugues Lépïc, as representative of Aleph Golden Holdings Sarl, (Chairman), Nayla Khawam and Lori Gonnu;
- The **Strategy Committee** is composed of four members: Hugues Lépïc (Chairman), Charlotte Corbaz, Didier Brédy and François-Xavier Ollivier;
- The **Environmental, Social and Governance Committee** (ESG) is composed of three members: Lori Gonnu (Chair), Charlotte Corbaz and Didier Brédy.



# ENVIRONMENTAL, SOCIAL AND GOVERNANCE POLICY

## ETHICAL RESPONSIBILITY

As part of its environmental, social and governance policy, Ekinops commits to activities with the desire to be a responsible company and to contribute to building a more responsible and sustainable global telecommunications industry.

This ambition involves being the employer of choice for the well-being of employees, being a responsible company with respect to third parties and limiting the environmental impact of its activities to achieve progress in reaching sustainable development goals.

Since 2021, the ESG Committee has defined Group societal policy and its objectives within the Board of Directors. Since January 1, 2024, has a "Corporate Sustainability Risks Manager", to reconcile risks with sustainable development and enable the company to better comply with ESG regulations.

The main new actions carried out during 2023 included the realization of a life cycle assessment on a representative product of the Acces range, the publication of the first CoP (Communication of Progress) submitted online to the UN Compact site, the granting of ISO 27001 certification for information system management, and the extension of the anti-corruption training to all employees.



**Lori Gonnu**

Chair of the ESG Committee

"Year after year, Ekinops structures and reinforces its CSR policy in all of its strategic components. Apart from the carbon emissions reduction trajectory, the Group also works daily to minimize the environmental impact of the equipment it markets to contribute to making the global telecommunications industry more responsible and sustainable."

## LIMIT THE ENVIRONMENTAL IMPACT OF OUR ACTIVITIES

Committed for several years to an emissions reduction trajectory, the 2023 Bilan Carbone® carbon assessment reflected a decline in metric tons of CO<sub>2</sub> emitted in terms of revenue (tCO<sub>2</sub>e/€m) of 40% compared with 2022.

Ekinops' policy is also aimed at minimizing the environmental impact of its products and the processes involved in manufacturing them. A life cycle analysis of equipment representative of the Access range and analyses of energy performance were carried out in 2023

to identify the impacts of products at each stage of the value chain. In 2023, all Ekinops product production sites were ISO 14001 certified, guaranteeing the responsible approach of the Group and the subcontractors involved in manufacturing and assembly.

Reflecting the success of this policy, Ekinops notably received the 2022 *Best Partner for sustainability* award from Orange Business Services.

## BEING AN EMPLOYER OF CHOICE

Under its human resources policy, the Group seeks to maintain and develop its employees' skills, ensure good working conditions and protect their well-being and health. particularly close attention was paid in 2023 to employee sentiment, notably with the "Pulse" anonymous surveys to discover their expectations and identify their motivation criteria.

Female representation continued to increase in 2023, with a 15% increase in the number of women employees, compared with 8% growth of the number of men employed. At end-2023, women represented 21% of the

total workforce. In addition, Ekinops renewed its partnership with the ADA Lovelace challenge in 2023, an initiative by digital companies in Lannion that encourages high school girls to take up careers in technology and software development.

In 2024, the Group plans to carry out collaborative work on corporate values. Developing a genuine corporate culture brings all employees together in pursuit of a common goal, driven by the desire to grow the business and a commitment to work collectively.

## RESPONSIBILITY VIS-À-VIS STAKEHOLDERS

The Group's main external stakeholders, customers and suppliers, play an essential role in Ekinops' business and represent significant CSR challenges.

Ekinops stepped up its policy in 2023 in terms of responsible systems and practices, including the integration of social and environmental criteria into purchasing and subcontracting practices, the highest standards of conduct in combating corruption and tax evasion, etc. A training program for all Group personnel on the risks of conflicts of interests and anticorruption continued in 2023. Ekinops also obtained ISO 27001 certification for its data security and information systems management.

At the societal level, after becoming a member of the United Nations Global Compact in 2022, the global initiative to promote corporate sustainable development, in 2023 Ekinops published its first "Communication on Progress" (CoP), available on the United Nations Global Compact site, which demonstrates the progress made by Ekinops in implementing the Ten Principles and its contribution to reaching the 17 Sustainable Development Goals.

All of the actions and initiatives implemented by Ekinops in terms of ESG, as well as the complete Carbon Report® are detailed in the Statement of Non-Financial Performance, page 91.

## ESG MARKERS

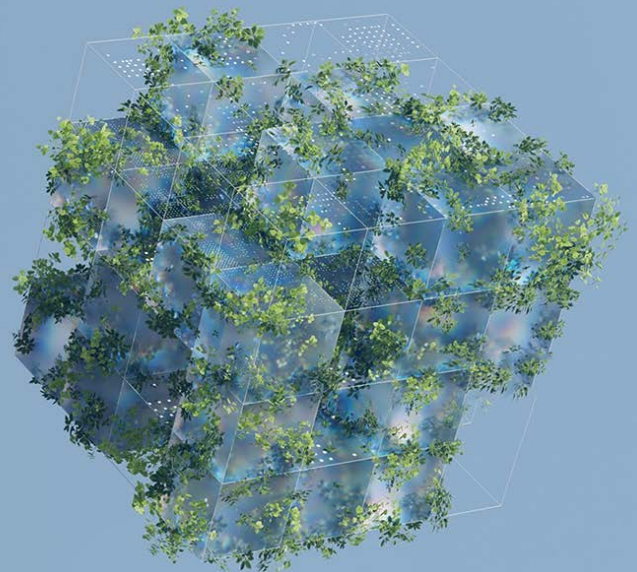


At the end of the EthiFinance ESG ratings Gaia 2023 campaign, Ekinops obtained an overall score of 62/100.

On the SOCIAL and STAKEHOLDERS themes, the company outperformed the benchmark (234 companies from the information technologies sector rated in this case). During this campaign, Ekinops exceeded NFRD (Non Financial Reporting Directive) thresholds, which means it is not possible to compare the rating with that of last year.



Ekinops ESG policy was also recognized with the award of a Bronze medal from EcoVadis and a 64/100 rating for 2023, higher than the benchmark average, placing the Group among the Top 16 best-performing companies in its sector.



# PRESENTATION AND CHANGES TO THE COMPANY

## General presentation of the Company

Ekinops is a telecoms equipment manufacturer focused on designing innovative transport, Ethernet service and data routing solutions and equipment for delivery to telecoms operators and enterprise networks.

The Ekinops solutions enable the deployment of high capacity and high-speed optical transport services, as well as enterprise managed services based on physical or virtualized platforms.

These operator class solutions, equipment and software are intended to help service providers and businesses address network evolution and the constant demand for greater capacity and agility.

The Group operates on a very fast-growing market, driven by the expansion of network capacity through either the deployment of new networks or by increasing the capacity of existing networks.

### Company milestones

The company was founded in 2003 and initially positioned itself on the optical transport market, building on the vision of its two founding engineers, both former Alcatel executives. With its extensive expertise in software (signal processing) and optics (laser technology), the Group initially offered solutions to manage transmission capacity based on two major technologies:

- (i) Wavelength Division Multiplexing (WDM), which is used to increase the bandwidth available on a single optical fiber by sending multiple signals simultaneously over different wavelengths; and
- (ii) Ethernet transmission protocol (as a replacement for other aging protocols).

Marketed under the Ekinops360 brand, this offering combines performance, flexibility and scalability, all at a competitive price and proved attractive to operators and institutions alike.

The Group integrated the activities of OneAccess in 2018, after its acquisition in Q4 2017. Ekinops' offering was thus broadened to include network access products (routers) and software marketed to telecoms operators. These integrated products (software and hardware) allow operators to offer managed communication services using equipment installed at their enterprise customers' sites.

The OneAccess brand products located on the companies' premises connect the operator's telecom network to the company's internal network.

2019 enabled the Group to add the OTN technology to its Optical Transport product portfolio. Ekinops acquired Padtec's OTN technology, along with its R&D team of 25 engineers based in Campinas, near Sao Paulo (Brazil).

OTN technology is used to switch data traffic over optical fibers, significantly optimizing network bandwidth utilization. Ekinops will thus be able to respond to the market's increasing calls to integrate this technology.

In 2020, Ekinops launched its comprehensive OTN/DWDM solution for optical networks as well as its Compose software brand to support companies' digital transformation within increasingly software-defined networks. Compose is the Group's software offering that helps operators and service providers supplement their portfolio with new value-added services such as SD-WAN, security and quality of service.

In 2021, Ekinops confirmed the growing success of its Optical Transport Network (OTN) solutions, reinforced by the launch of the new ETSc compact platform solution at the beginning of the year and its proven leadership in virtualization and SD-WAN technologies in Access. In October 2021, Ekinops acquired the SixSq start-up, a software as-a-service (SaaS) provider for Edge Computing, which provides an ultra-innovative solution that complements Cloud Computing with data processed directly on the company's site.

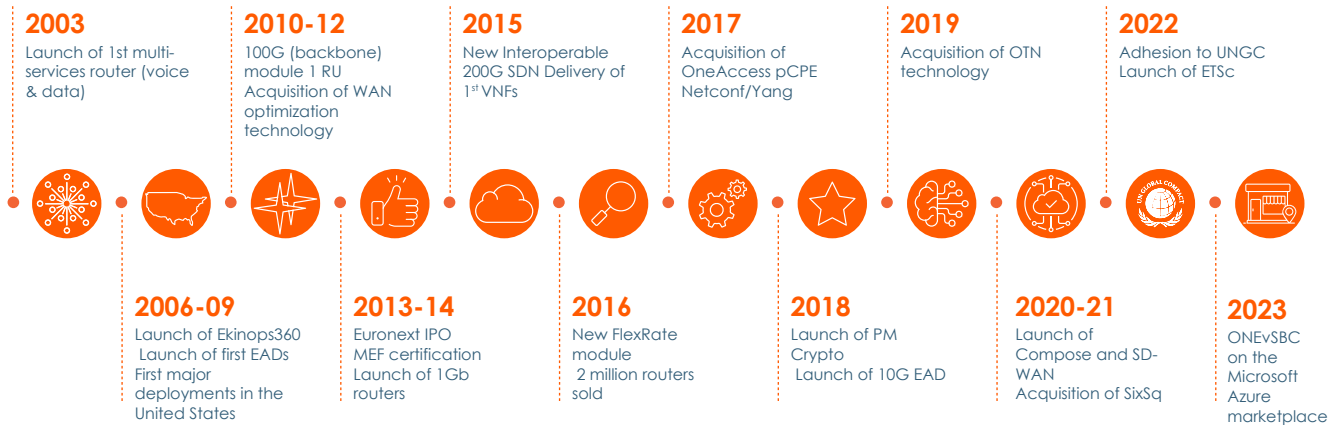
In 2022, Ekinops ratified its adhesion to the UN Global Compact, the greatest global initiative promoting corporate sustainable development. The United Nations Global Compact, (UNGC) is a voluntary initiative enabling companies to participate in the creation of a global framework to ensure sustainable development by adopting responsible and creative governance and acting as informed citizens, aware of planetary challenges. Companies and organizations which sign the UNGC commit to respecting and contributing to its ten principles, in four areas: human rights, labor standards, environment and the fight against corruption.



In 2023, Ekinops made its ONEvSBC (Session Border Controller) available on the Microsoft Azure marketplace, enabling suppliers of services to easily design their voice services for corporate customers.

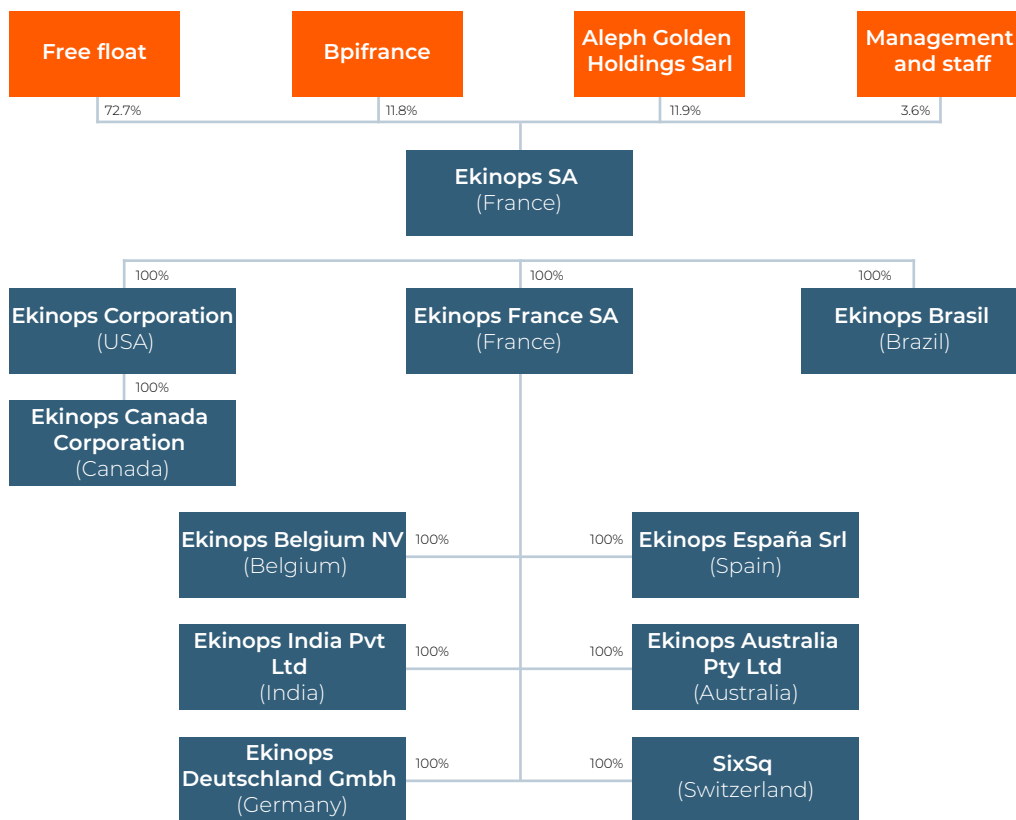
Also in 2023, Ekinops marketed its first industrial routers with the “FlexCPE” functionality. These products offer the possibility of charging and running

third-party applications in the form of containers. In this way, it extends the possibilities of a traditional router (pCPE) to offer functions at the edge of the network. Compared with Cloud usage, this enables faster response times, better confidentiality and a reduction in the carbon footprint and cost of use of data centers.



### Organizational chart

At the date of filing of this Universal Registration Document, the legal organizational chart for the Ekinops group was as follows:



## Property, plant and equipment

The Ekinops group does not own any property. Its main fixed assets are laboratory equipment, as well as the industrial equipment at its Ekinops Belgium subsidiary.

## DESCRIPTION OF BUSINESSES

### General overview of the Company's businesses

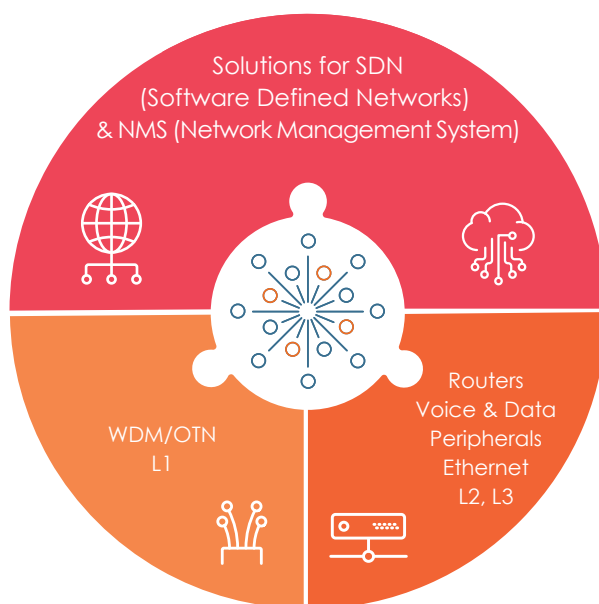
The Group provides open, reliable and innovative network connectivity solutions. The Ekinops teams are constantly developing equipment and software to enhance the network industry and create new high value-added commercial opportunities for the Group's customers. Ekinops' portfolio of solutions and services consists of three fully complementary brands:

- Ekinops360, to meet the needs of metropolitan, regional and long-distance optical transport networks (layer 1), based on two complementary technologies: WDM for a simple, compact, integrated architecture; and OTN for complex multi-vendor environments
- OneAccess, for layers 2 and 3 (access and routers) to offer a wide range of physical and virtualized deployment options for routing voice and data;
- Compose, which includes solutions to make networks software-defined with a variety of management tools and services, including the scalable SD-WAN Xpress solution and the SixSq *Edge-to-Cloud* solutions.



### COMPOSE

Manager NMS, Director, OneManage Services (OneOS6, SD-WAN, VNFs, CNFs), Middleware (OneOS6), Nuvla



### EKINOPS360

Optical Transport solutions for Metro/Long-haul/etc.

### ONEACCESS

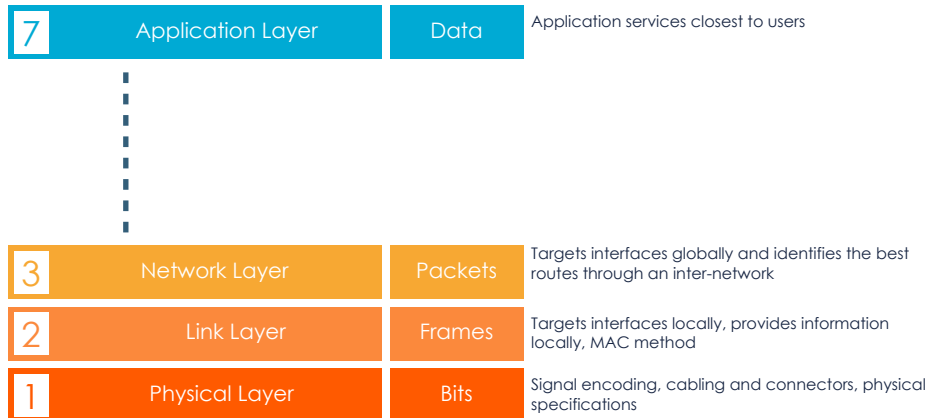
Platform for Branch Offices and Edge Networks

## Positioning within telecommunications networks

Ekinops operates at both the “physical layer,” known as level 1, through the WDM and OTN optical transport platforms, and at also layers 2 and 3, the “data link” and “network” layers with its routing solutions. The combination of Ekinops' technical solutions enables a wide choice of deployments, both physical and virtualized, for data transmission and for corporate services.

**Network levels**

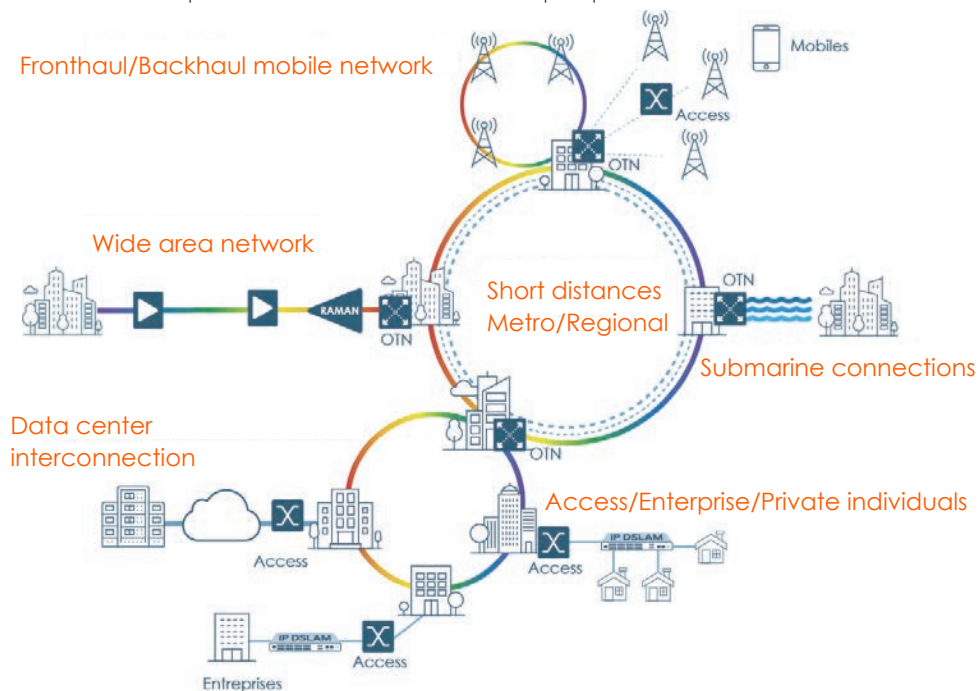
1. Optical transport over fiber (layer 1/L1)
2. Communication/Ethernet services (layer 2/L2)
3. IP routing services (layer 3/L3)



The level 1 physical layer is itself segmented into geographic/distance criteria and allows for high capacity transport of data:

- I. the "Metro network": the local metro network, which connects telecoms operators' points of presence to each other, to companies, to cell towers (3G, 4G, 5G) and to video servers. The transport technology typically used for Metro transport is called “Metro WDM”;
- II. the "Backbone" network: the backbone of the rest of the network, with greater bandwidth. It connects the metro networks, which are often several hundreds or thousands (submarine networks) of kilometers apart, to each other.

The diagram below shows the points of contact where Ekinops operates at the access and infrastructure levels:






## Ekinops' offering

Groupe Ekinops' offering is based on three product families. Optical transport, network access, as well as network management and virtualization. All the physical platforms marketed by the Group are "carrier class," which means they are highly specific to

operator and service provider customers. Ekinops' solutions enable a wide range of network operators to deploy and manage new generation networks which provide services to companies.

	<b>EKINOPS360</b>	<b>ONEACCESS</b>	 <b>COMPOSE</b>
<b>Customers</b>	Telecoms operators and service providers		
<b>Markets</b>	Metro & Longhaul	Edge & Access	Network management and virtualization
<b>Solutions</b>	CWDM/DWDM Transponders & Muxponders ROADMs OTN products	Ethernet access devices uCPE enterprise voice & data routers	Virtualisation, VNFs, CNFs SD-WAN NMS <i>Edge Computing</i>
<b>Services</b>	Support, Network design, Consulting, Security audit, Certification, etc.		

### The Optical Transport (Ekinops360 brand) range

Adapting the networks to cope with soaring demand for data transport requires optimum use of the optical fiber transmission medium. The goal is to "forward" the maximum amount of data at the same time and as quickly as possible.

Ekinops offers operators a comprehensive range of equipment (transponders, multiplexers, etc.) covering all the needs of a highly interoperable market.

The equipment is generally installed at each end of the link, and at intermediate sites, in bays, at the customer's site or in datacenters.

The standard equipment consists of:

- one or more cards depending on the customer's specific needs (data aggregation, transport over short or long distances, etc.);
- in certain cases, pluggable cards;
- a chassis, some can integrate up to 20 cards.

Ekinops' sales in this segment come from both complete sets of equipment and additional cards as its customers' networks grow.

Ekinops develops its own optical line interphase technology but also offers pluggable optical solutions for applications where performance is not an issue, which makes marketed platforms even more flexible.

Since it acquired the Optical Transport Network (OTN) technology, Ekinops supplies ETSc products (Ekinops Transport Switch compact), which are used to switch data traffic over optical fibers. They significantly optimize bandwidth utilization and protecting traffic on the networks, more specifically for large operators' network cores. OTN technology is critical to providing high bandwidth in multi-vendor optical network environments (end-to-end traffic management) and responding to the very rapid growth in data traffic (big data, Cloud), in particular for mobile operators (5G networks).

OTN technology provides a solution built around a scalable architecture so as to rapidly increase switching capacity and support packet optical transport (network layer 2). ETS allows for flexible management of datastream and protocol traffic transmitted over 200G-400G modulated optical wavelengths, increasing to transport capacity of more than 1T.

## Routing range (OneAccess brand)

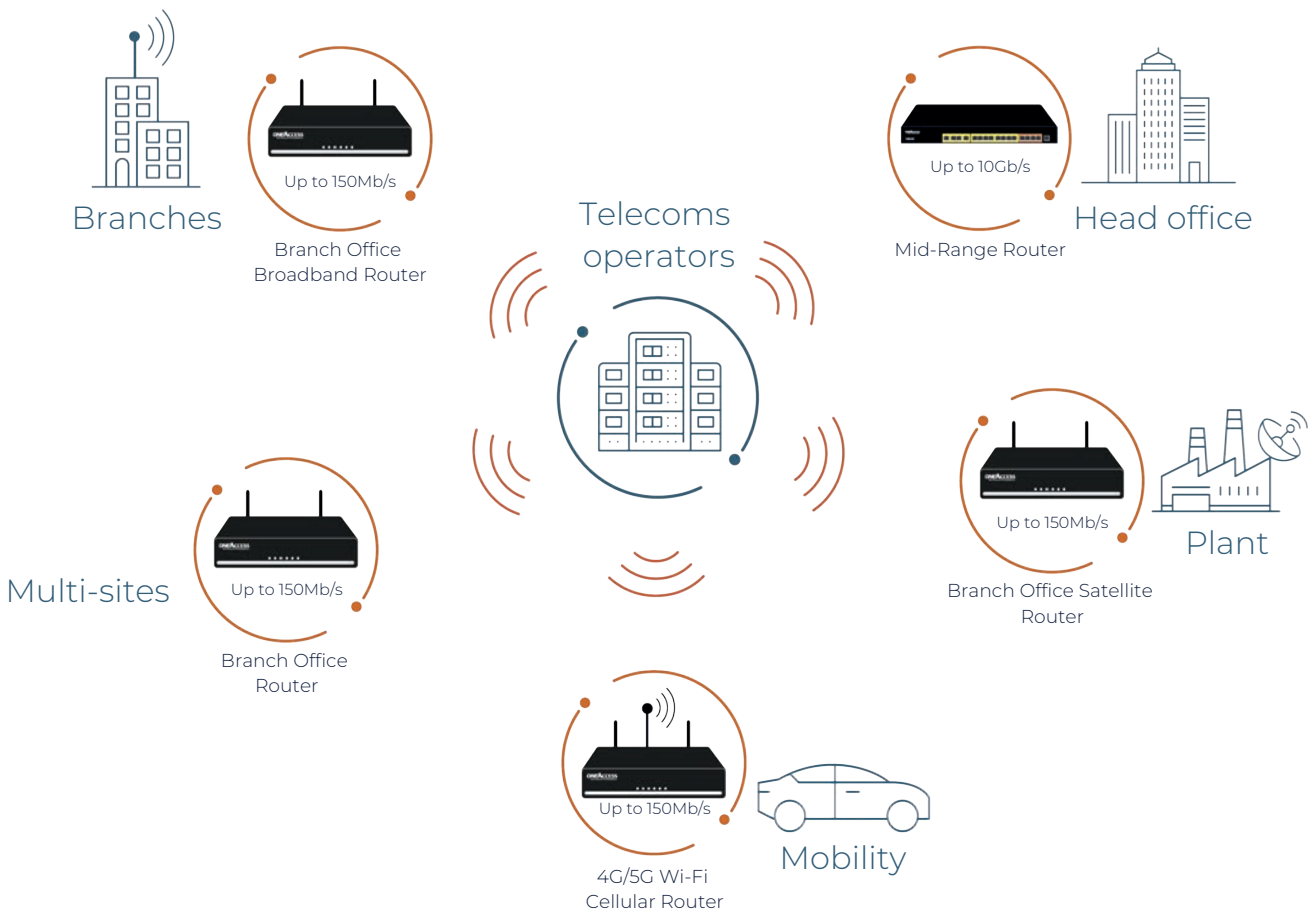
The OneAccess brand offers integrated products, i.e. software and equipment, in three major families:

- pCPE physical routers; virtualized uCPEs or capable of hosting FlexCPE containerized functions.
- Ethernet Access Devices (EADs) for services that do not cover IP;
- virtualized platforms (uCPE) to host virtualized functions (VNF) or containerized functions (CNF).

These products allow operators to offer managed communication services using equipment installed at their corporate customers' sites.

These products, which connect the telecom network to the company's internal network, come equipped with one or more types of access technologies (DSL, fiber, 4G, 5G, cables and other), and with a set of hardware and software functions to offer a wide range of enterprise services such as:

- routing;
- secure and reliable data transmission;
- voice over IP (VoIP);
- prioritization and optimization of certain critical business applications.



## The software range (Compose brand)

Compose brings the Group's network access and optical transport software products together. Compose enables operators to expand their service portfolio with software-defined network solutions, such as SD-WAN, and security and quality of service by using platforms from Ekinops and third parties (third-party white boxes).

Compose includes Ekinops software (e.g., Director), network/Cloud management software, virtualization functions (VNFs, virtual network functions), and SD-WAN (software-defined wide area network) and also provides access to an Ekinops-certified ecosystem of about 30 of the most widely used VNFs and now CNFs (containerized functions) on the market.

The Compose brand includes the software elements of Ekinops' existing Ekinops360 and OneAccess portfolios, namely the Célestis (optical transport) and OneManage (network access) management platforms. Compose also houses Nuvla and Nuvla.io, components of the SixSq Edge Computing suite.

### ✓ OneOS6

OneOS6 is the cornerstone of Compose. OneOS6 is a modular software solution providing a full range of services that are compatible with all physical platforms (Ekinops or white boxes) and can be activated on demand. Fully open, OneOS6 transforms any of Ekinops' own or third party equipment into a multi-service platform.



### ✓ Virtualization

The ONEOS6 operating system has the particularity that it can be used on Ekinops' physical platforms, but also on platforms called white boxes, OVP is the name of the OneAccess white box range. OneOS6 can also be integrated as a component of OEM (Original Equipment Manufacturer) solutions. The virtualized version of OneOS6 is marketed under the ONEOS6LIM name. Network services are embedded:

- as separate virtualized functions commonly known as VNFs, such as vRouter;
- as containerized functions, such as Nuvla.io marketplace business applications;



### ✓ SD-WAN

SD-WAN is a software-based approach to network management that uses the public Internet network to provide services comparable to MPLS. SD-WAN Xpress stands out for its simplicity, comprehensiveness and ability to offer the functions expected on all of Ekinops' existing equipment and to offer an approach regrouping all on a single platform, with a "One Box" approach.



## ✓ Edge Computing

Integrated within the Group since 2021, the SixSq offering consists of the "Nuvla.io" marketplace, which hosts all types of business applications in container format in the Cloud, and the NuvlaEdge software, which converts enterprise routers, or other open hardware platforms capable of processing data, into smart Edge systems.

The Ekinops and SixSq solutions are already integrated through the Ekinops virtualization offering (OneOS6- LIM).

## Services and support

As well as its network connectivity solutions, Ekinops offers a portfolio of design services, implementation and support to assist operators in their deployment and optimization, while also reducing their

Enhanced with SixSq technologies, OneOS6 becomes an Edge Computing solution to execute all types of business applications in bare-metal container format. Service providers can offer a genuine marketplace of downloadable applications directly to devices using OneOS6. The use cases are infinite. In this way, all OneOS6 routers as well as the uCPEs can "carry" business applications downloaded from the Nuvia.io marketplace, in particular for the Internet of Things (IoT), Industry 4.0, smart retail, etc.

## Nuvia.io

maintenance costs. Ekinops has a global assistance organization which offers services via variable Service Level Agreements (SLAs).

## The market, the customers

Focused on a target operator customer base, the Group's objective is to provide them with open, trusted and innovative network connectivity solutions. The Group is expanding in a global market featuring:

- very strong growth, reflecting exponential data management needs (speed, less latency, performance, security);

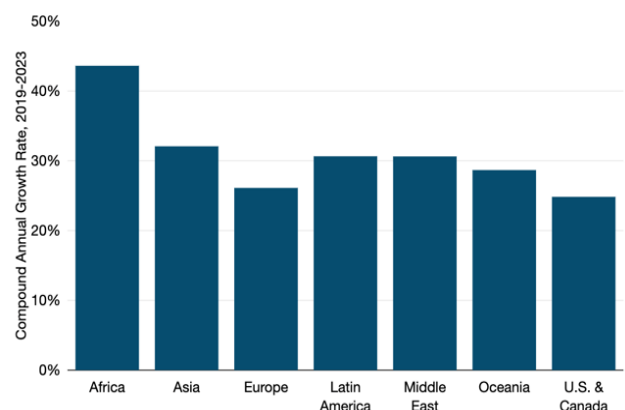
- intense competition between the different players with varied profiles and key national interests;
- fundamental technological trends which model the requirements of customers at the heart of challenges faced by equipment makers;
- Interoperability is imperative; the importance of an active ecosystem.

## Strong growth

Driven by the proliferation of triple-play (video, voice, data), video-on-demand and Cloud Computing services, as well as mobile services, global demand increased by 23% in 2023, according to Telegeography. After the surge in demand generated by the pandemic in 2020, annual growth returned to "normal", slowing slightly in the bandwidth market, which has nevertheless expanded almost three-fold since 2019<sup>(1)</sup>.

Strong growth in capacity, visible across all regions. Top of the list: Africa, with 44% CAGR (compound annual growth rate) between 2019 and 2023. Next comes Asia, generating 32% CAGR over the same period.

**International Internet Bandwidth Growth by Region**



(1) Source Telegeography - 2023 (<https://blog.telegeography.com/total-international-bandwidth-now-stands-at-1217-tbps>).



This growth phenomenon should continue over the coming years, boosted by the deployment of 5G and innovations in the mobility sector, IoT (Internet of Things) applications, artificial intelligence and virtual or augmented reality technologies for industrial applications or retail.

The correlation between performance (speed) and network flexibility, on the one hand, and increased usage, on the other, is a key growth factor in the

## Intense competition

In the global market addressed by the Group (Optical Transport and Network Access), international competition is very heterogeneous and significant, although consolidation moves have reshaped the equipment maker landscape.

Market players can be divided into two main categories:

- the major groups: Cisco (United States), Nokia (Finland), Huawei (China), Infinera (United States), Fujitsu (Japan), Ericsson (Sweden), Juniper (United States), NEC (Japan), Ciena (United States), ZTE (China), which mainly address tier 1 operators;
- the smaller companies: Fiberhome (China), Adva Optical Networking (now part of Adtran), Packet Light (Israel), Teldat (Spain), AudioCodes (Israel/United States), SmartOptics (Norway), which address operators of all sizes.

Huge political stakes influence the competitive landscape for telecom equipment makers owing to the critical dimension linked to security of both the media chosen (infrastructure) and the data systems (transmission).

## Fundamental technological trends

Market-driving factor: companies which, for the most part, have initiated their "digital transformation", profoundly changing how they operate. To do so, they adopt, and consumers with them, new telecommunication technologies with several objectives:

1. Modernizing communication and work methods. Examples are manifold: shift from traditional telephony to IP telephony, reduction in own investment in servers and data centers, in favor of Cloud solutions, replacement of in-house software with SaaS (Software as a Service) applications, use of WAN MPLS and internet on the same site access, greater development of flexible work methods (remote and multi-site).

markets where the Group operates. Indeed, speed is a crucial catalyst for IP traffic. The average speed of global bandwidth should continue to increase, to more than double between 2018 and 2023, from 45.9 Mbps to 110.4 Mbps<sup>(1)</sup>.

Faced with this increasing demand for both capacity and speed, it is essential for operators to increase the bandwidth of their networks. This will be made possible by investing in technological evolutions.

## Significant national interests

Numerous government incentive and financing programs have been introduced throughout the world to promote the expansion and modernization of networks. For example, in the United States, several billion dollars will be released over the coming years, notably in rural and poorly served regions, as part of programs like the Rural Digital Opportunity Fund (RDOF).

For the whole of the European Union, government stimulus programs totaling tens of millions of euro have been launched (such as France 2030, for example). Investments are concentrated in the network access sector through to metropolitan networks. For strategic reasons (sovereignty/security), these programs should benefit mainly western suppliers owing to the partial or total rejection of Asian or even US equipment makers.

2. Developing new sources of revenue by increasing productivity. This could be to sell in regions where they had been absent, to modernize plants or points of sale with IoT-type (Internet of Things) software functions, or process automation.
3. Controlling or reducing costs by avoiding, for example, duplication of equipment. A software application which has an increasingly important societal dimension, targeting reduced energy consumption or minimizing the ecological footprint.

(1) Cisco Annual Internet Report (2018–2023) White Paper.

In summary, these transformations are based on these technologies and major trends:

- Cloud, disaggregation, virtualization;
- SD-WAN;
- 5G;
- sustainable development.

Ekinops is likely to continue to benefit fully from these market developments, thanks to its suitable range of equipment.

#### ✓ Virtualization, Cloud and disaggregation

The move to the Cloud and the rapid growth in bandwidth available to end users requires significant capacity and flexibility for optical networks linking data centers, peripheral computer equipment, network access and base stations. Faster, "on-demand" network and bandwidth deployment are essential requirements, as are reduced operating costs and a competitive supply chain.

The stakes for operators are twofold. They seek equipment manufacturers capable of helping them create more efficient infrastructure to enable the greater levels of connectivity, promised by virtualization (NFV & SDN). They must also generate competitive service offerings, with companies under pressure to reduce services and telecom infrastructure management costs. In a context which favors business solutions such as those offered by SixSq (Edge Computing) or PaaS-type (Platform as a Service) services.

The underlying trend is therefore toward open systems separating software from platforms (disaggregation). New technologies offering greater programmability, greater bandwidth and more flexibility are therefore key.

Virtualization offers service providers and systems integrators optimization at several levels: no need to deploy new equipment when introducing new network services, independence vis-à-vis suppliers, speed of customer reaction and better time-to-market for new services. Ekinops, as a pioneer in virtualization, has a comprehensive product and service range adapted to suit operators.

#### ✓ SD-WAN (Software-Defined Wide Area Network)

The SD-WAN (software-defined wide area network) is very dynamic, with 30% CAGR (compound annual growth rate), it expanded from €475m in 2017 to €1.5 bn in 2021. The market should reach \$4.9 bn (around €4.58 bn) by end-2024.<sup>(1)</sup>

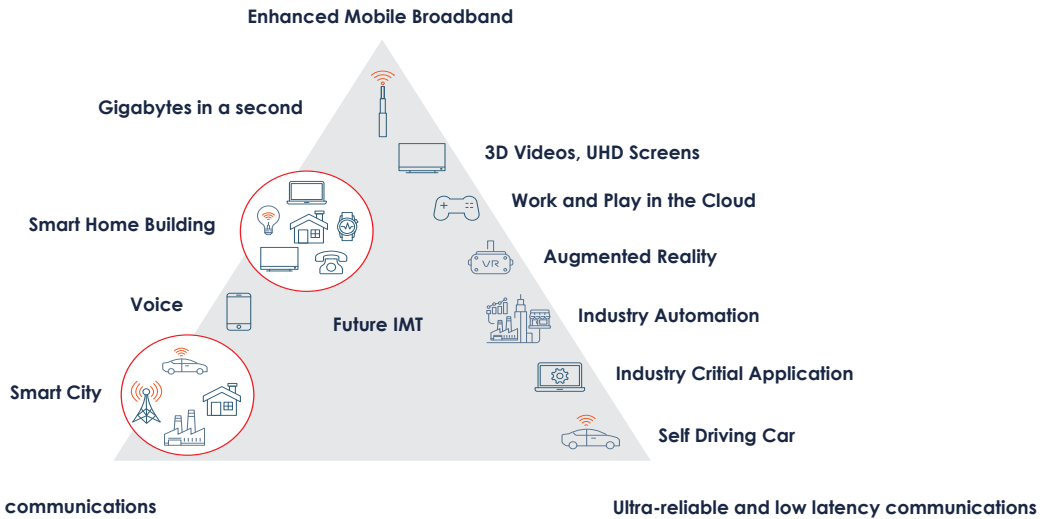
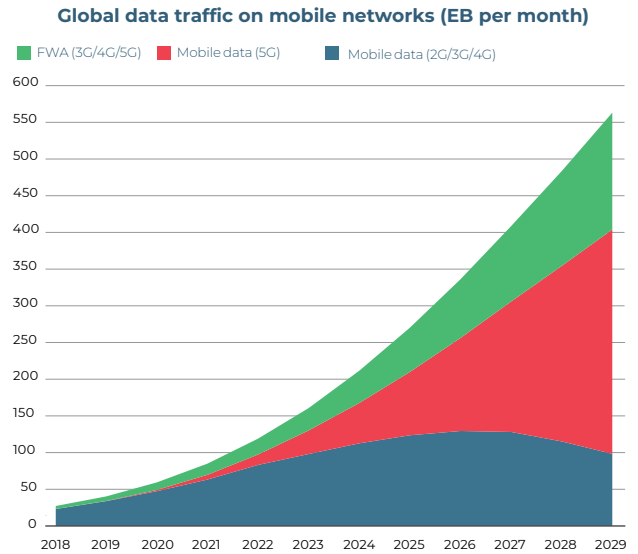
Designed for Cloud Computing, SD-WAN is a new approach to corporate network management with a constant optimization component. The principle is based on a software environment which enables constant steering of how all links (ADSL VDSL, fiber optics, 4G) are operator for each of the network activities of the company and for all sites, at the applications level. Operators are prepared for SD-WAN, in particular to address the market for major companies which benefit more easily from the economic advantages offered by SD-WAN, notably as part of multinational deployments.

For the Group, SD-WAN is a strong opportunity and a limited threat. It is true that SD-WAN partially overlaps with the router market, but creates a need for universal CPEs (uCPEs) where Ekinops has a competitive offering and is positioned as an accelerator in introducing multi-vendor SD-WAN offerings. Ekinops has its own SD-WAN offering targeting medium-sized operators and companies, a volume segment where operators cannot find satisfactory offerings. Leveraging OneOS6, the SD-WAN Xpress solution is the first natively developed from recognized middleware routing. It stands out for its simplicity, its wealth of features and its ability to offer extended functions on all existing Ekinops equipment, with a "One Box" approach.

(1) Source: Omdia-2022.

✓ 5G, what impact for Ekinops?

Global mobile traffic is exploding, as show in the chart opposite. We are also observing use cases and types of services where 5G could apply, including for corporate services, a key market for Ekinops and its Access range.



Three categories of services supported by 5G – Source: ITU-T IMT-2020

The exponential increase in the number of antennas required to cover the territory will have a strong influence on the Group's transport infrastructure activity. The emergence of Layer 3 (routing) at the bottom of 5G towers and the renewal of routers currently in place in companies also increase the market opportunity for network access activities.

✓ Sustainable development



In view of growing demands for sustainable development, the entire telecoms market ecosystem must work together to prepare for a future where growth has a low environmental impact.

Operators are increasingly looking to their technology provider and OEM partners, who belong to their value and supply chain. Together, they must innovate to manage the lifecycle impact of their networks, including energy consumption, greenhouse gas emissions and other resource and environmental impacts.

These additional constraints represent an enormous opportunity for the Group, which is able to mobilize its innovation resources to propose a roadmap of products and services that meet network performance and sustainable development requirements.

## Interoperability and ecosystem

Existing telecommunications networks are very heterogeneous in terms of infrastructure and services. Indeed, the many devices in place have been deployed over the years and have been designed with different protocols (Ethernet, SONET/SDH, etc.) and data rates, meaning a very large number of different data formats cohabit on the networks.

Equipment manufacturers must therefore manage to both aggregate these protocols in order to transport data quickly and homogeneously, and also to make the platforms and software that underlie them as flexible as possible in order to easily adapt.

Interoperability is a major issue for operators for both optical transport and access services. In the optical layer, it is essential to realize the benefits of automation and to integrate legacy equipment into software-defined networking (SDN).

The same is true for services, as operators have to organize different migration phases (from analog and ISDN to IP, or more recently to virtualization).

Ekinops is firmly committed to openness and interoperability, as illustrated by its participation in the Open-ROADM consortium.

## Competitive advantages

Ekinops boasts numerous competitive advantages:

- openness and simplicity: without proprietary blocking mechanisms and agnostic solutions (multi-orchestrators, multi-access), Ekinops takes a collaborative approach to customer relations;
- open, interoperable and compatible multi-vendor transport and access solutions;
- the programmability of its optical transport solutions (WDM and OTN) which optimizes costs and manufacturing processes;
- specialized operator network functions supported by a broad portfolio of access platforms (multi-service routers, white boxes, Ethernet platforms) and a portfolio of pre-integrated or independent virtualized functions;

Thanks to its constant desire to work on an open basis, Ekinops is building an ecosystem of technological partners to complete or adjust its offer as closely as possible to operators' demands.

Among others the Group works with:

- **Dell EMC OEM Solutions (Dell Technologies Group) and Lanner**

These partnerships are designed to provide advanced, high-performance virtualization solutions.

- **Intel**

Ekinops is part of the Intel Networks Builder (INB) ecosystem that accelerates network transformation through the development and deployment of proven Software-Defined Networks (SDN) and network function virtualization solutions.

- **Microsoft Teams**

The enterprise SBC (Session Border Controller) solution included in the OneOS6 middleware has achieved Microsoft Direct Routing certification, enabling enterprises to benefit from the full range of services offered by the Microsoft Teams platform.

- +3 million routers sold: an asset for the migration of operators to future services, such as SD-WAN;
- real flexibility in service migration and deployments for the implementation of network virtualization;
- a culture of specialist operators and service providers;
- a strong European identity, key at a time of tension with American/Asian suppliers;
- an ability to forge strategic partnerships to build an offer evolving towards a product mix with more software and services.



## A sales organization that favors direct, multi-range distribution

The Group has opted for a commercial approach that favors a close relationship with operators and generates higher margins for its two product lines. Since the end of 2017, the sales teams have been responsible for selling all product lines.

To this end, the Group's sales force is divided between the two strategic zones as follows

- EMEA APAC region: Frank Dedobbeleer (Chief Revenue Officer EMEA & APAC);

- United States region: Kevin Antill (Chief Revenue Officer North America).

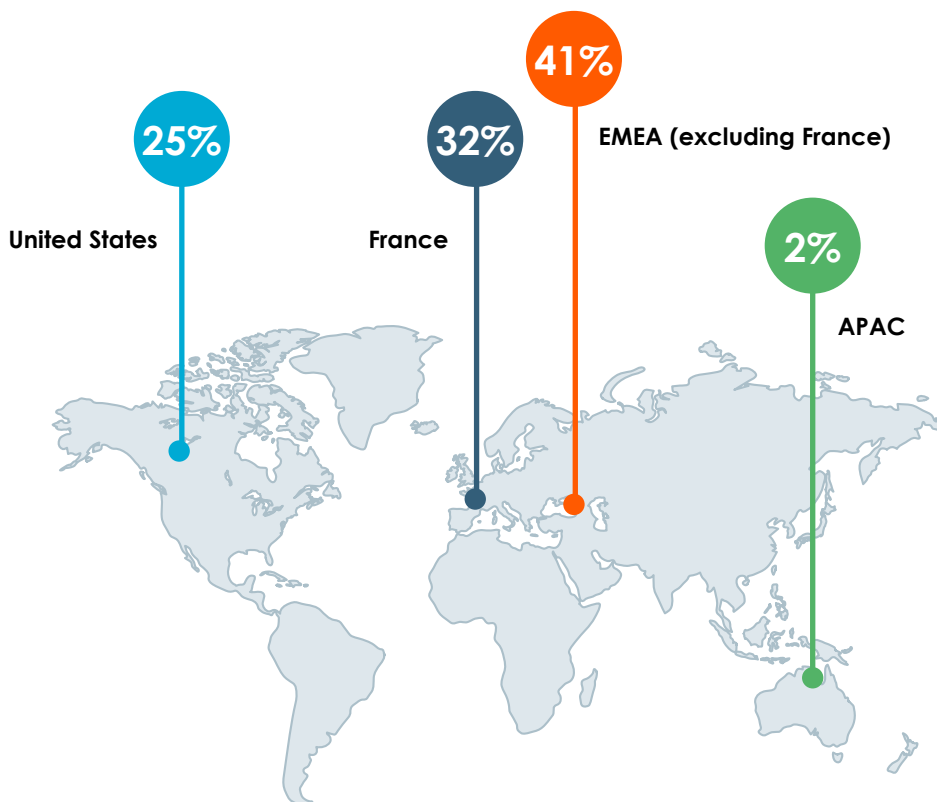
In addition, the Group also has indirect marketing channels in about 10 countries through distribution partners. The Group also has two partnerships with OEMs (Original Equipment Manufacturers) who resell Ekinops products under their own brand.

## An installed base of international clients

Ekinops' business approach is based on the desire to respond precisely to customers' needs by offering them equipment with the best cost/performance ratio, ease of use and particularly high reliability.

The Group has succeeded in establishing a solid client base in Europe, Africa, Asia-Pacific (APAC) and the United States.

**Geographical breakdown of global sales (at end-2023)**





<https://www.ekinops.com/fr/>