

NORFEST: Fully diverse fibre backhaul for AI data centres

A high-capacity subsea fibre route connecting 11 key locations in Southern Norway

The race to build – and connect – southern Norway's AI data centres

Southern Norway has become a favoured location for AI infrastructure providers, with significant presence in hubs like Oslo and Kristiansand, and many more data centres being announced.

Now, the race is on to get that new infrastructure built, powered and – crucially – connected to the global fibre backbone.

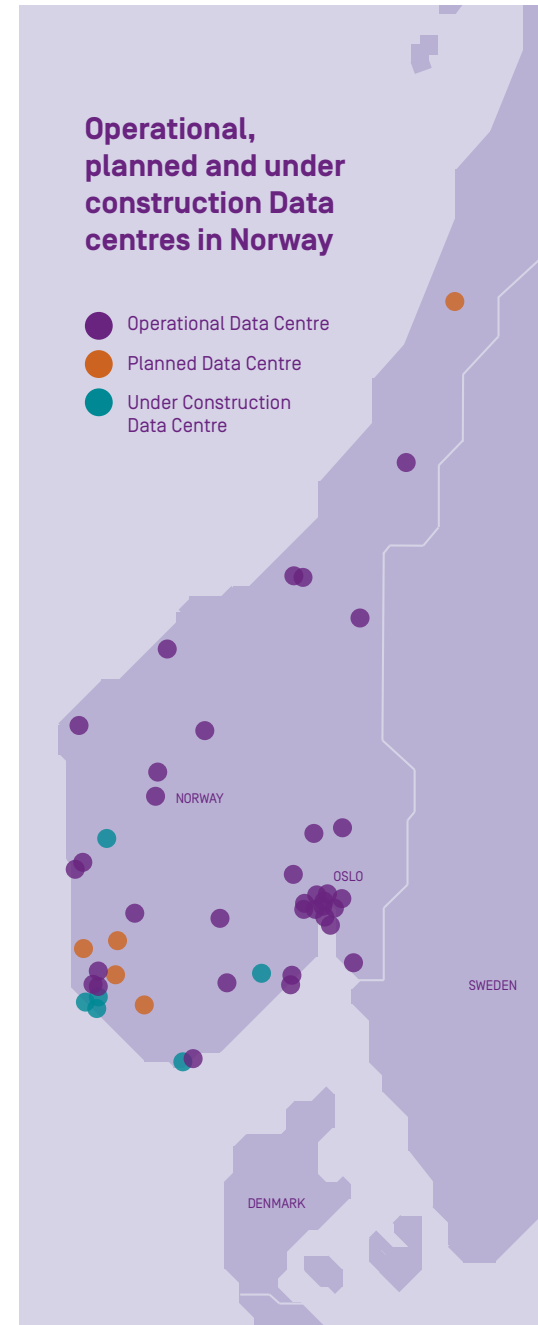
Pressure on terrestrial fibre networks

The connectivity part poses challenges. As more hyperscalers and neoscalers invest in southern Norway, pressure is starting to build on terrestrial fibre networks. Finding fast, resilient and uncongested backhaul routes is getting harder. Hiring specialists to connect and manage those routes takes time that AI companies can't afford to lose.

Norway's rugged geography also means the scope for route diversity is limited. Fibre tends to piggyback on rail lines, roads and power lines. That creates the risk of congestion and complicates access for maintenance, upgrades and repair, especially during severe weather.

Route diversity challenges for AI companies in southern Norway

When customers demand and expect uninterrupted uptime, these risks must be mitigated. A second fibre route might once have been an adequate safeguard, but for AI and high-performance computing (HPC), it's not enough. Triversity (three routes) and quadiversity (four routes) are now the key to eliminating downtime risk.



For AI companies investing in southern Norway, this creates three challenges:

- 1.** Finding fully diverse fibre routes with the right capacity, speed and resilience
- 2.** Meeting aggressive timelines to get campuses and AI factories connected
- 3.** Managing a complex portfolio of high-capacity fibre routes on a day-to-day basis

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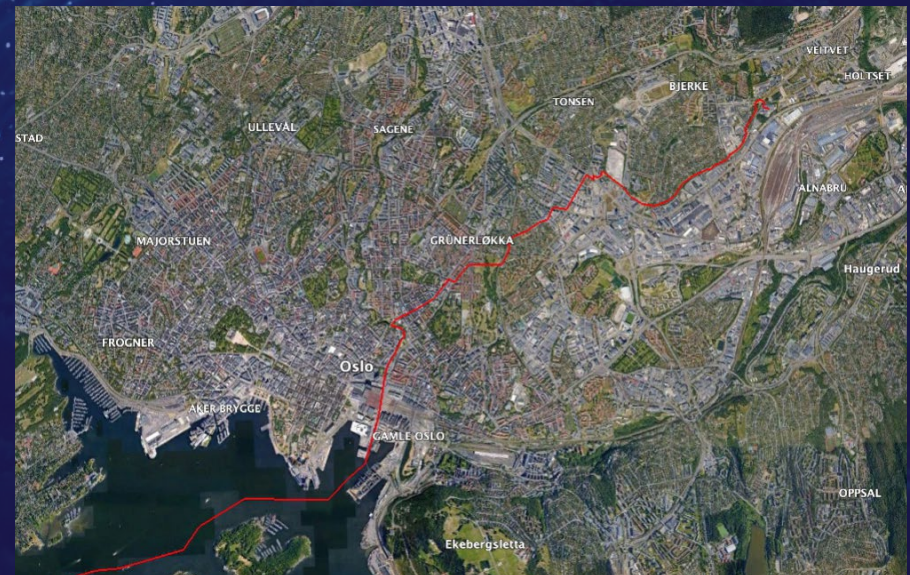
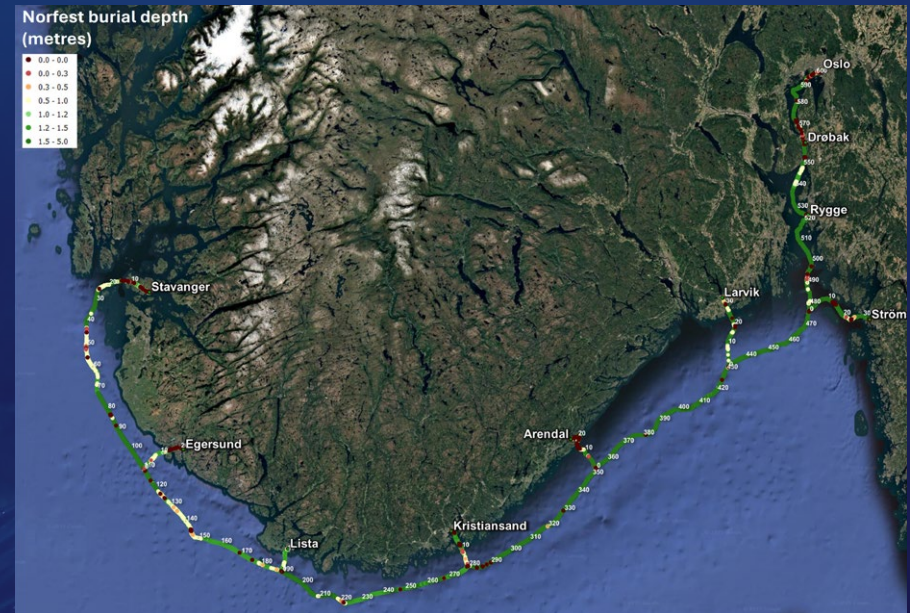
Tampnet offers a solution to all three challenges. Our NORFEST system is a 100% diverse route connecting 11+ locations in Norway and Sweden, including Stavanger, Egersund, Kristiansand and Oslo – with full diversity even in the Oslo metro area.

Buried in a deep natural trench lying a short distance offshore, NORFEST combines the speed, capacity and latency of terrestrial fibre with the physical resilience of subsea.

NORFEST solutions include dark fibre, wavelengths, or a fully managed optical fibre network [MOFN] for fastest time to market, cost predictability and ease of management.

Capacity for today, scalability for tomorrow

NORFEST has the capacity for today's AI services and the scalability for tomorrow's. Designed to meet the stringent requirements of AI and HPC providers, it offers AI-scale capacity, state-of-the-art photonics, multi-layered resilience for maximum protection, industry-leading SLAs and a 25-year cable guarantee.



4 reasons to choose NORFEST for route diversity

1. AI-scale capacity

The NORFEST system was designed to meet the soaring capacity needs of hyperscalers, neoscalers and other HPC services providers. Features that enable scalable capacity include:

Unrepeated subsea fibre:

Amplifiers and other electronics are located onshore, with the subsea cable comprising passive, unrepeated fibre. This enables easy access to electronics, significantly boosting uptime and reliability while significantly reducing maintenance costs.

Next-generation photonics:

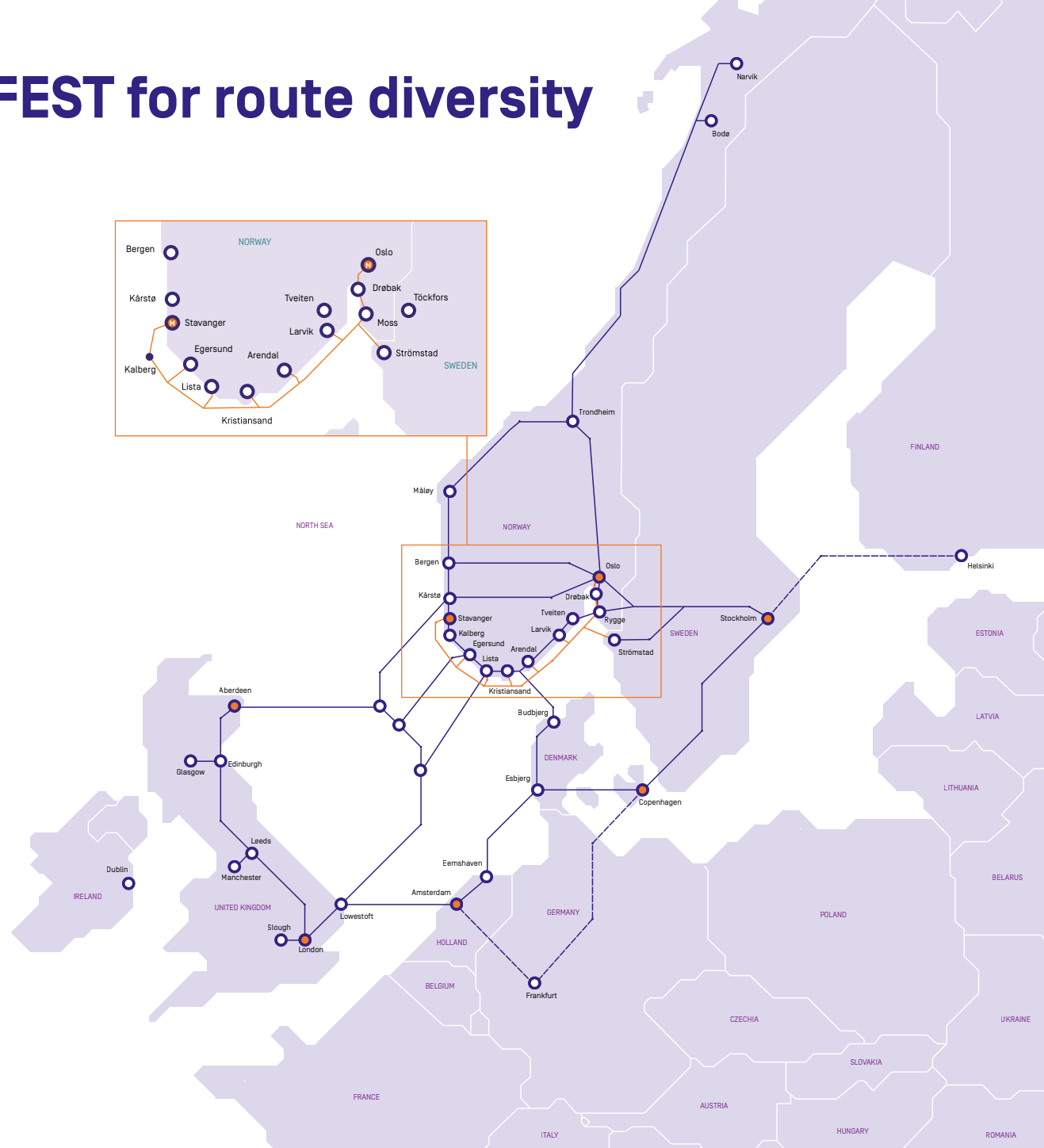
Lit NORFEST fibre pairs employ state-of-the-art electronics, including Ciena WaveLogic transponders, which currently deliver 27 Tbps throughput while optimising energy consumption and cost per bit.

11+ local Points of Presence:

NORFEST comes ashore at nine intermediate locations between Stavanger and Oslo, creating local points of presence at some of Norway's most in-demand data hubs. The route offers the potential for additional landings by adding branching units to the existing unrepeated cable.

Global interconnect:

NORFEST is integrated with Tampnet Carrier's redundant, super-fast subsea and terrestrial network infrastructure, providing direct links to Frankfurt, Amsterdam, London and beyond. Our open-access approach means the system is designed to interconnect with other operators in key locations along the route.



2. Future-proof scalability

In an industry where needs evolve fast and innovation moves even faster, NORFEST is ready for whatever's next in AI, HPC and GPU-as-a-service. Future-proofing benefits include:

Scalable capacity:

NORFEST's high fibre count means there's almost infinite room to scale. Start with one FP and add more as your needs grow.

Open system access:

With all electronics housed on land, dark fibre customers can install, manage, maintain and upgrade their choice of network equipment at any time during the entire life of the system.

25-year minimum cable guarantee:

Manufactured by Nexans to withstand subsea pressures, corrosion and environmental conditions, the NORFEST cable is guaranteed to deliver peak performance over a lifespan of more than 25 years.¹

3. Multi-layered resilience

NORFEST exploits a natural trench just off the coast of southern Norway to offer advanced protection against damage from sabotage and environmental disturbances. A multi-layered approach to resilience includes:

Deep-water trench:

Water depth in the Norwegian trench varies between 300-600m, helping to protect the cable from trawling, anchors and malicious interference.

<1.5m burial depth:

The NORFEST cable is buried to a depth of up to 1.5 meters, offering further protection against accidental or malicious disruption.

Micro-routing:

Precision installation equipment allowed the cable to be laid along a micro-planned route that avoids potential high-risk zones (such as known bottom-trawling areas), further reducing the risk of disturbances.

Physical threat detection:

Tampnet technologies for state of polarisation (SOP) detection and distributed acoustic sensing (DAS) provide early warning of potential and actual fibre incursions, reducing downtime risk and mean time to repair (MTTR).

Coast Guard monitoring:

The NORFEST system lies entirely within Norwegian territorial waters monitored by the Norwegian Coast Guard.

Sustainable build techniques:

The use of horizontal directional drilling (HDD) to bring the NORFEST cable ashore has preserved the natural environment at landfall sites.



4. Designed-in reliability

Business models rooted in real-time, high-performance computing need ultra-reliable connectivity from ultra-reliable providers. NORFEST has reliability designed into every layer, protecting your workloads, your business and your reputation.

Secure colo-huts:

Built to a secure design, our Tampnet-owned colo-huts house essential electronics with uninterruptible power supplies, creating a stable and monitored environment that strengthens security and uptime.

Rapid repair:

NORFEST offers a highly competitive mean time to repair (MTTR), since all electronics are housed onshore, enabling ready access for maintenance and repair. Underwater cable break repair times are minimised through continuous SOP and DAS monitoring, which promptly detects and localises disruptions.

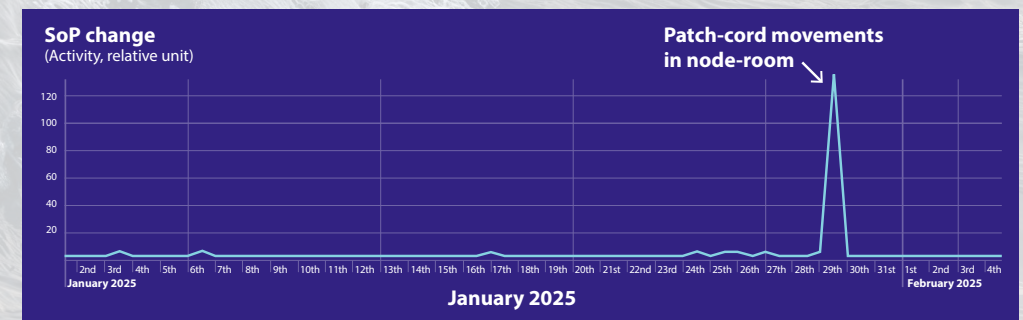
SLA:

NORFEST is backed by an SLA with availability and uptime guarantee. Wavelengths and MCFN services are managed by the Tampnet Network Operations Centre (NOC), combining deep optical expertise with regional knowledge and experience of working with hyperscalers and neoscalers.

Innovating for resilience: polarisation fibre-sensing on NORFEST

A quiet fibre can be assumed to be a safe fibre. Our polarization fibre-sensing technology will spot any vibrations or physical impact along the fibrepath that could indicate imminent disturbance.

As illustrated in the figure, when installation personnel are present in a node room—such as in this planned scenario—working near or handling patch cables, their activity appears in the polarisation sensing activity plot and triggers alarms for NOC personnel, even when not impacting the service performance. This ensures that any unplanned or unauthorised work is promptly detected.



Add NORFEST to your route portfolio

Tampnet offers three technical solutions for NORFEST, with flexible commercial models to meet your current and future business needs.

Handle everything in-house with dark fibre, get the managed capacity you need with wavelengths, or choose a fully-managed optical fibre network (MOFN) built and operated to your specification.



1. Dark fibre: Your fibre, managed by you

For companies with a frequency licence, capex budget and the expertise to light and manage a backhaul fibre route, our dark fibre offering can get you the capacity you need at a PoP that's at or close to your southern Norway campus. All NORFEST electronics are housed onshore, so you can choose how to light your fibre, and access and upgrade your electronics whenever needed.



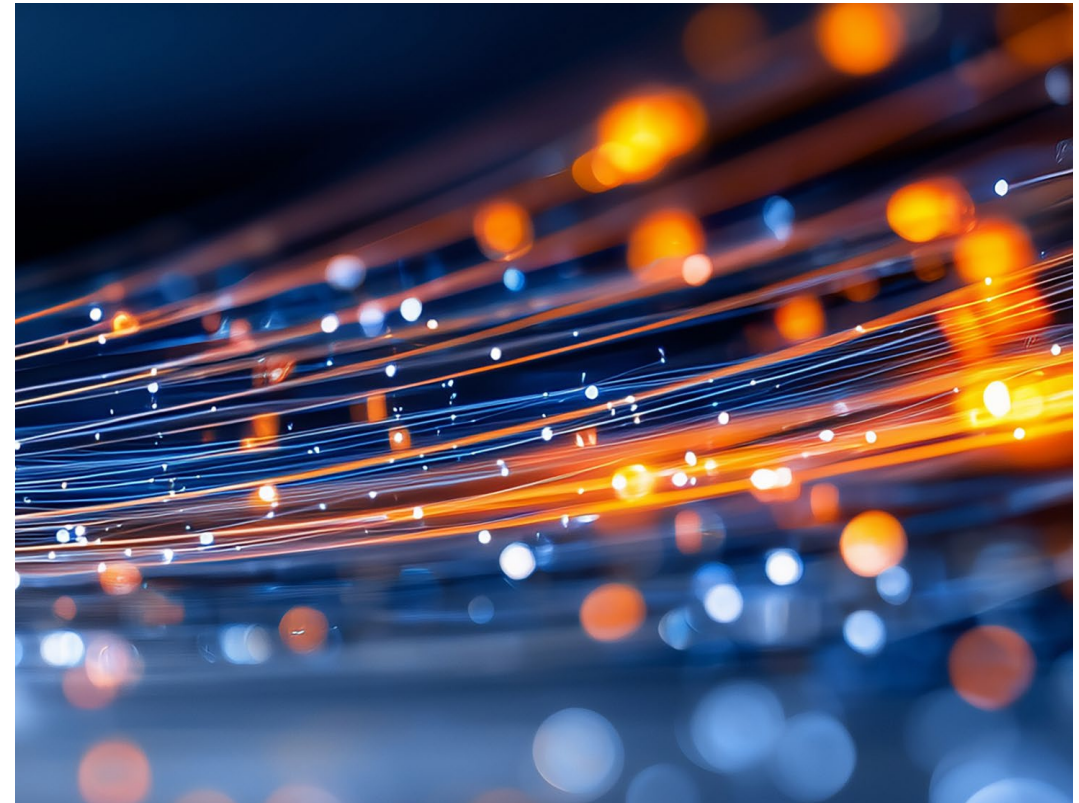
2. Wavelengths: The capacity you need, managed by Tampnet

Get the capacity you need on one or more fibre pairs, managed by Tampnet experts and with next-generation photonics from Ciena. NORFEST offers wavelengths of 400G and 800G with flexibility to scale, while current-generation Ciena WaveLogic 6 transponders deliver 27 Tbps throughput with optimised power draw and low cost per bit transported.



3. MOFN: Fastest time to market, built and operated to your specs

For AI infrastructure companies moving into Norway and/or under significant time pressure, a managed optical fibre network is the fastest and easiest way to get connected. Tampnet will connect, configure and manage your NORFEST fibre route to your technical specifications, delivering it all as a managed service backed with a stringent SLA.



Solution Spotlight Managed Optical Fibre Network (MOFN)

Under a MOFN agreement, Tampnet deploys, operates and manages the network on your behalf – including last-mile connectivity from our nearest PoP into your data centre if required.

With no need to apply for licences, negotiate permissions, build out your own fibre or hire an in-region team of optical networking specialists, it's the fastest way to get connected.

Costs will vary according to requirements, but will typically include upfront deployment costs, recurring (operate and maintain) costs, and any capacity upgrades.

You maintain control throughout the lifetime of the contract. We build the network to your specification and observe your choice of maintenance windows. We also provide access to real-time network performance data to monitor SLA adherence.

The NORFEST story: A new route for southern Norway

Like the hyperscalers and neoscalers investing in Norway today, in 2021 Tampnet was searching for new, diverse routes for our carrier business.

With terrestrial routes increasingly congested, we took inspiration from our work in the oil and gas industry – where our high-capacity subsea fibre network delivers always-on connectivity to platforms and vessels in the North Sea and Gulf of Mexico.

Physical interference on our subsea assets was compellingly low compared to terrestrial routes. As Norway's key data hubs are located around the coast, a subsea route seemed a compelling solution.

A near-shore trench offering advanced protection

It was then that we spotted a unique opportunity. Just off the coast of southern Norway lies a relatively deep trench offering a high degree of protection from fishing activity, anchors and malicious interference. It also lies within the 12nm of national waters monitored by the Norwegian Coast Guard, providing an added layer of protection.

Even better, the natural characteristics of the trench meant we would be able to bury all 749 km of the cable, providing added protection against physical disturbance.

The best of subsea with the best of terrestrial

This natural, near-shore trench would allow us to combine key benefits of subsea, like low risk of disturbance and high protection from the weather, with key benefits of terrestrial, like short distances between points of presence (PoPs).

It also meant we could use a festoon topology to connect 11+ key hubs along the route—with all electronics hosted on land, leaving the cable as low-maintenance passive fibre.

The trench meant we could offer customers a fully diverse, future-proofed route with no reliance on third-party host infrastructure. We even identified a unique north-south route into central Oslo, avoiding the east-west routes used by existing fibre infrastructure serving the Oslo metro area.

Connecting southern Norway to the globe

The business case was compelling, and the new system, dubbed NORFEST (for NORdic FESToon), was swiftly signed off by Tampnet investors. The first branch was laid from Egersund on 27 June 2023 with the final landing made at Capri, Sweden on 6 December.

NORFEST has since proven its resilience across a wide range of weather and tidal conditions and maritime activity – and is now successfully connecting southern Norway's AI and HPC data hubs to the globe.



About Tampnet Carrier

Tampnet Carrier is widely recognised for delivering high-quality, predictable connectivity, built on more than 25 years of operational experience in some of the world's most demanding environments. The network has evolved out of Tampnet's original offshore infrastructure and continues to expand through strategically located points of presence (POPs), providing route diversity and direct connectivity to major data centre hubs via purpose-built infrastructure.

Backed by a strong willingness to invest, Tampnet Carrier does not compromise on quality. We take on complexity and make it work - meeting the requirements of hyperscalers and neoscalers with resilient, scalable connectivity delivered on time and supported by direct access to an industry-leading network operations centre (NOC).

Find out more

If you have questions about NORFEST, or if you'd like to know more about Tampnet Carrier's global connectivity services, please get in touch with us at:

carrier_sales@tampnet.com