



# Broadband communication for everybody and everywhere

*presentation  
by  
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Bridging Societies

# Nera has provided wireless transmission solution to the market for more than 60 years



Revenue 2008  
**220 M EUR**

Offices in  
**39 countries**

Employees (worldwide)  
**800**

# Nera's vision

**A leading microwave solutions company, our customers' fast and flexible specialist**

## **Leading:**

- Nera shall achieve at least a 5% market share in the total market for microwave transmission in 2010
- Nera shall be the leading competence center for microwave transmission

## **Microwave solutions:**

- Market leading microwave based solutions portfolio
  - Primarily microwave products
  - 3rd party products as needed to optimize microwave solutions
  - Optimum balance of Quality, Price and "plug and play"
- Services related to above portfolio; planning and design, SLA, repair, installation etc.
- Customer driven solutions

## **Fast and flexible:**

- Always deliver as promised to the customer (but don't promise more than you have to)!
- Module based building blocks for faster logistics and flexible product ranges
- High service degree and fast response time
- Rapid time to market for New products
- Willing to go the extra mile

## **Specialist:**

- Complete and undivided focus on microwave solutions
- The most competent microwave transmission people
- The most innovative company within microwave transmission

## Nera moved production into a new optimized factory in Slovakia in mid 2008.



- Nera moved its production from Bergen to Slovakia (next to Eltek) in 2006-2007 to achieve competitive production value add costs
- June 2008, the production was moved into new facilities that are optimized for Nera's needs
- Approx 200 highly skilled employees
- More than 26000 radios produced 2008
- Export value 80 M EUR

**More than 20 M EUR invested**



# The new Evolution Series

## A market leading, common microwave platform radio system

Evolution Series offers several key improvement areas

- ✓ **Software Defined Radio**
- ✓ **Scalability** - the same hardware to be used in all parts of the network
- ✓ **Easy upgrades** - grow with the traffic and pay as you grow
- ✓ **Traffic Node** - several radio directions in one node
- ✓ **Future proof** - Evolution towards packet based transport network
- ✓ **Quality in focus - improved Reliability** - reduces the operational cost



## Services Nera can offer from Slovakia

- Additional to production Nera has established
  - Strong Quality organisation
  - Global logistics centre
  - Global Service & Repair centre
  - Project management team
  - Group of field engineers
  - Customer training centre
  - Sourcing activities
  - Sales office
  - Good relation with local partners



**Training centre in Liptovsky Hradok**

**This ensures superior service for local and regional customers**

## World-class wireless transmission

- Providing wireless transmission solutions to Network providers:  
Mobile, Fixed, Broadcast, ISPs, Offshore, Utilities, Defence and Governments.



## Turn key solutions

- Handling all aspects of the network developing process.



## Future proof networks

- Future-oriented attitude, enabling you to stay at the forefront of technological developments.



## Low operational cost

- Strong focus on Quality in design, production and project implementation

# Nera solutions and client examples

## Mobile & WiMAX BackHaul

Nera is a Wireless backhaul specialist that provides equipment and services needed to design, build and maintain a future proof network during the migration to all IP connectivity

## Wireless Access Networks

Nera offers the best of the breed WiMAX portfolio, supporting a wide range of applications

## Fixed Networks

Nera has the ability to implement all carrier-class wireless transmission solutions for telecommunications carriers worldwide

## Government & Defence

Nera provides all aspect of planning, designing and deploying wireless solutions for Government authorities and Defence agencies

Support all relevant frequency bands use by government and agencies globally

## Nera clients - samples



## Offshore Communication

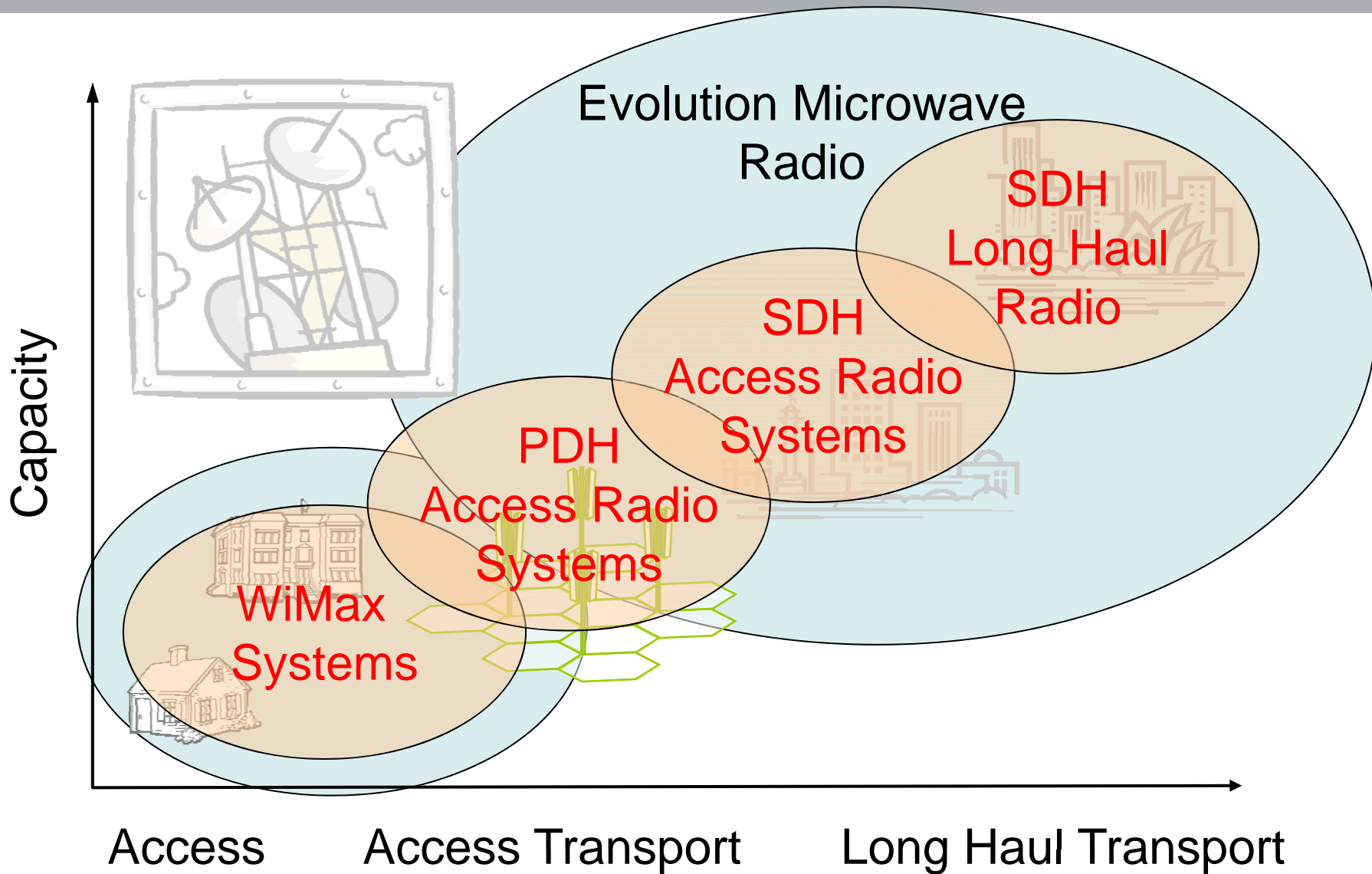
Nera provides high capacity wireless communication solutions for moving rigs and ship-to-shore connections

## Network Management

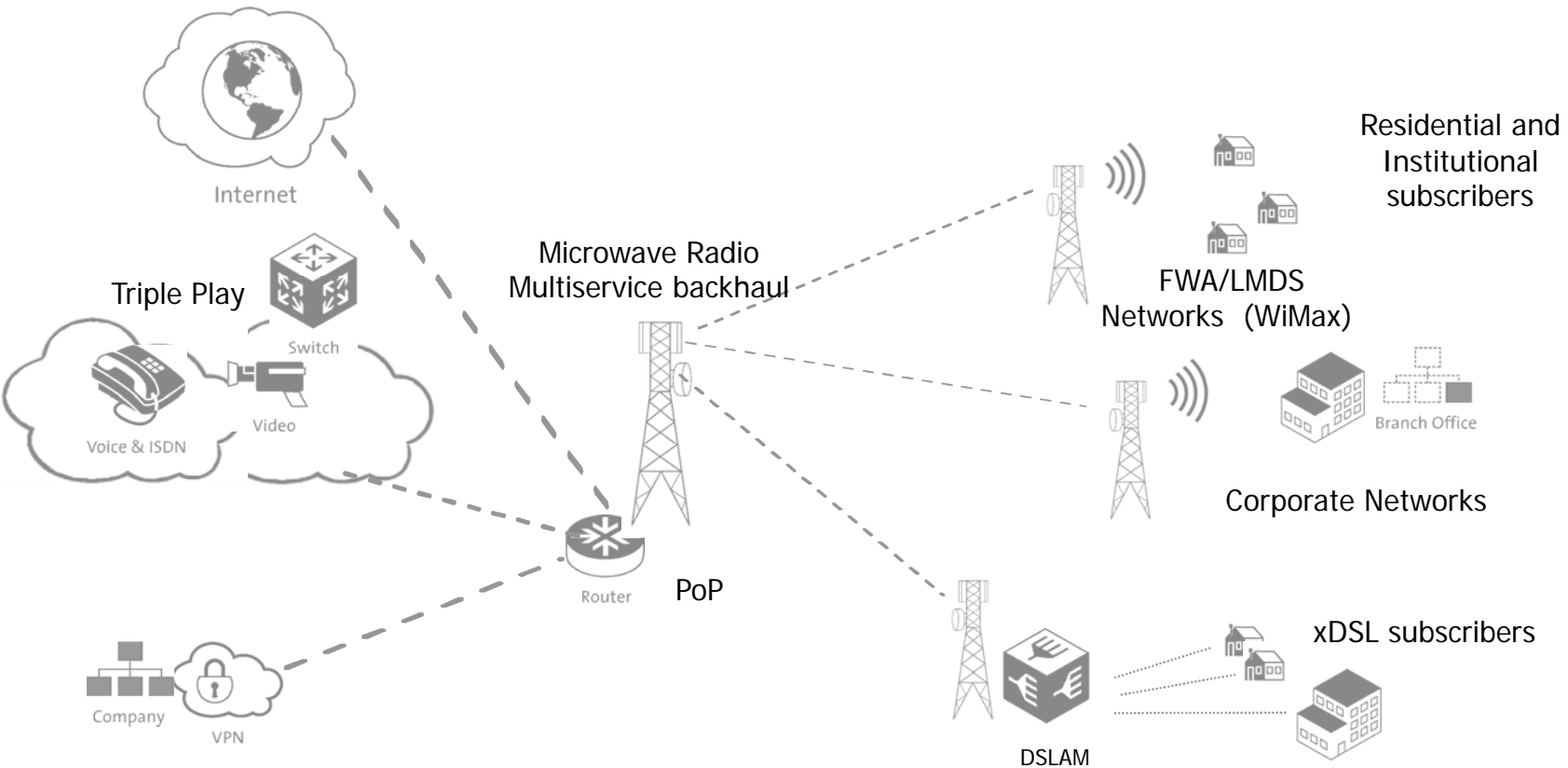
Nera NetMaster NMS is offered to manage and control Nera P-P radios, our WiMAX elements and other 3rd party elements



# Nera Wireless Solutions

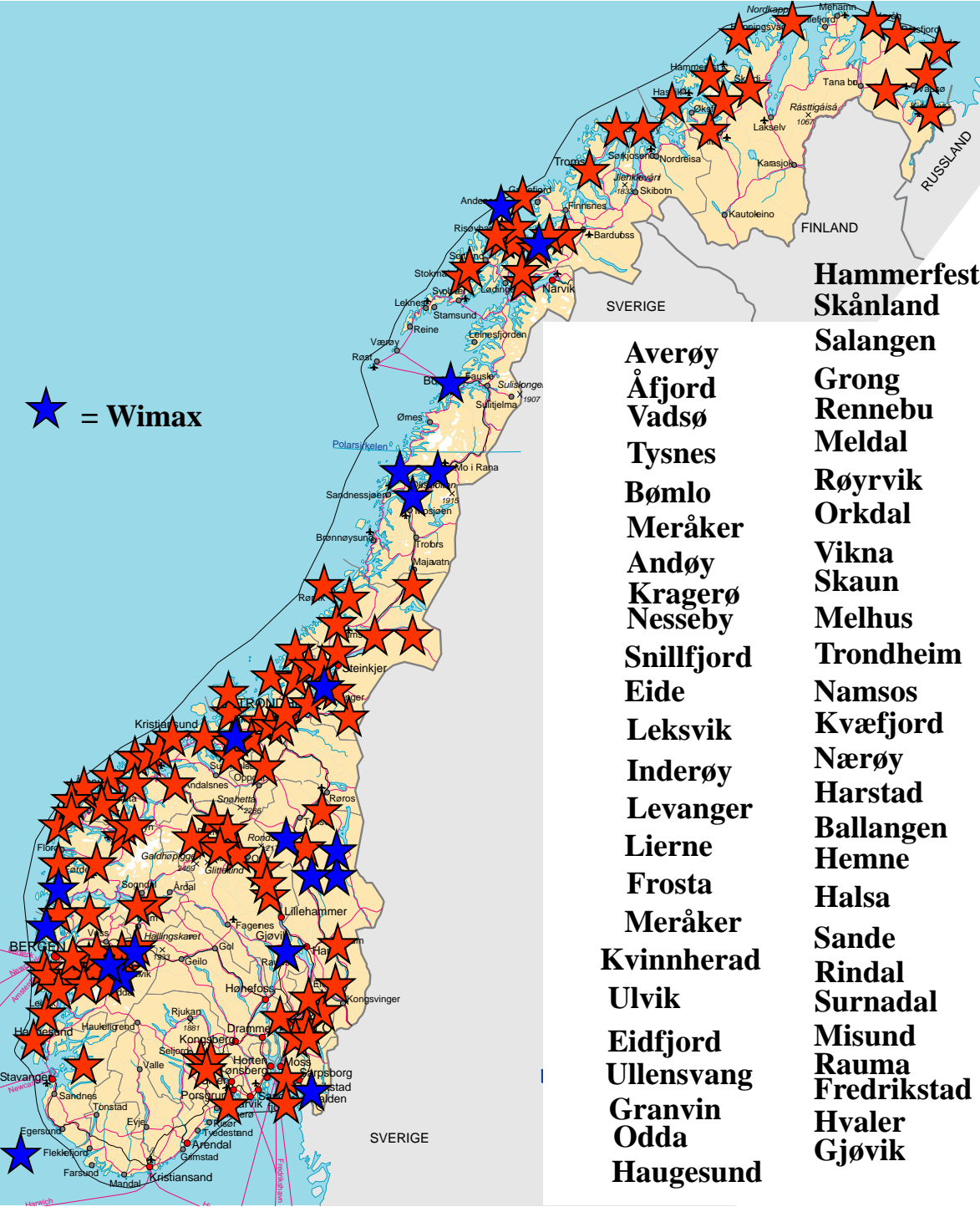


# Basic Design of Microwave backhaul



- Backhaul of PtMP basestation traffic
- Backhaul of DSLAM
- Scalable capacity with effective QoS support for mixed services
- Ethernet only or Ethernet over SDH
- Mixed Ethernet and TDM services
- Ethernet L1 or Switched VLAN transport

# Municipalities with FWA and WiMax from Nera



Averøy  
 Åfjord  
 Vadsø  
 Tysnes  
 Bømlo  
 Meråker  
 Andøy  
 Kragerø  
 Nesseby  
 Snillfjord  
 Eide  
 Leksvik  
 Inderøy  
 Levanger  
 Lierne  
 Frosta  
 Meråker  
 Kvinnherad  
 Ulvik  
 Eidfjord  
 Ullensvang  
 Granvin  
 Odda  
 Haugesund

Hammerfest  
 Skånland  
 Salangen  
 Grong  
 Rennebu  
 Meldal  
 Røyrvik  
 Orkdal  
 Vikna  
 Skaun  
 Melhus  
 Trondheim  
 Namsos  
 Kvæfjord  
 Nærøy  
 Harstad  
 Ballangen  
 Hemne  
 Halså  
 Sande  
 Rindal  
 Surnadal  
 Misund  
 Rauma  
 Fredrikstad  
 Hvaler  
 Gjøvik

Bodø  
 Måsøy  
 Ibestad  
 Vågsøy  
 Åurland  
 Ålesund  
 Bremanger  
 Ørsta  
 Volda  
 Flora  
 Austevoll  
 Tysnes  
 Fitjar  
 Kvam  
 Askvoll  
 Jondal  
 Modalen  
 Stryn  
 Bø (begge)  
 Jølster  
 Vågsøy  
 Sauherad  
 Nome  
 Evenes  
 Øyer  
 Selje  
 Aukra  
 Sør Varanger  
 Haram

Marker  
 Norkapp  
 Bjugn  
 Eid  
 Hitra  
 Lom  
 Lesja  
 Sjøk  
 Ås  
 Sel  
 Vefsn  
 Dovre  
 Steinkjer  
 Vågå  
 Rendalen  
 Ringebu  
 Sørums  
 Nord Fron  
 Fusa  
 Samnanger  
 Fet  
 Bodø  
 Tjeldsund  
 Gloppen  
 Rælingen  
 Engerdal

Nesna  
 Nes  
 Loppa  
 Kvænangen  
 Skjervøy  
 Karlsøy  
 Tromsø  
 Kvalsund  
 Rissa  
 Ørland  
 Bjarkøy  
 Lærdal  
 Bærum  
 Berlevåg  
 Båtsfjord  
 Vardø  
 Finnøy  
 Oslo  
 Tolga  
 Gjemnes  
 Hadsel  
 Elverum  
 Alta  
 Halden

# Andøya - a small piece of BroadbandNorway

**NordlysNett**

Broadband to everybody everywhere  
in Andøy!



# Customers

Local government

School

Institution

Kindergarten

Population

Business

Norwegian Sea  
ARCTIC OCEAN

Andfjorden

SENJA  
Store Bunkevatnet

Skrolsvik

Hofsøy

umen

69

Langenes

Stø

Nyksund

Klo

Strengelvåg

Oppmyre

Gisløy

Alsvåg

Store Sandnes

Skjolde

Nygard

Svindalen

Steinland

Holm

Bremnes

Sandset

SCANDINAVIA

Nordmela  
school/kinder  
garten

Bleik school

Dverberg/Saura  
school

Åse  
school

Risøyhamn school

Medby school

## Andøy

- 5.482 Inhabitants
- 3.000 in Andenes
- Fish, defence, space-exploration and tourism are main businesses

## Kids at Dverberg/Saura school



## The fibre is found!

Fibre from the mainland  
to Spitsbergen Island is  
passing over Andøya

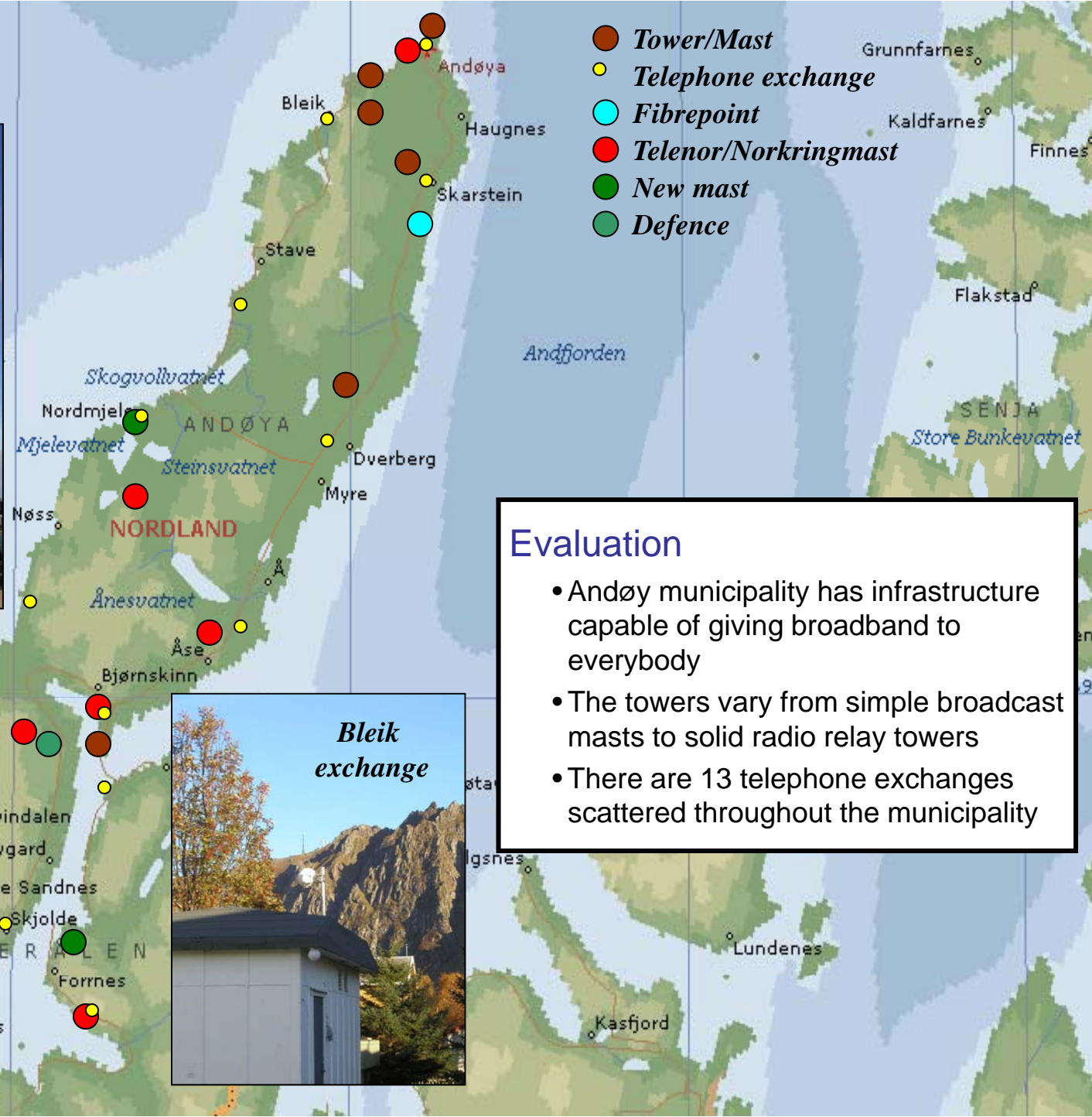




# Infrastructure

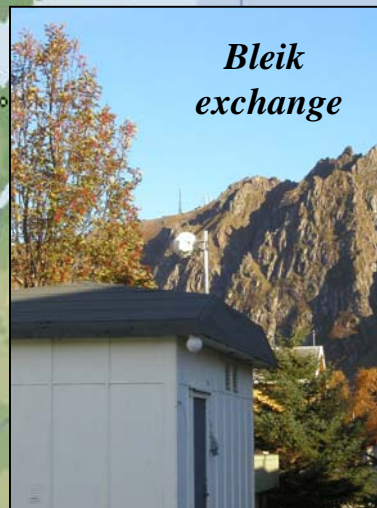


- Tower/Mast*
- Telephone exchange*
- Fibrepoint*
- Telenor/Norkringmast*
- New mast*
- Defence*



## Evaluation

- Andøy municipality has infrastructure capable of giving broadband to everybody
- The towers vary from simple broadcast masts to solid radio relay towers
- There are 13 telephone exchanges scattered throughout the municipality



# Broadband Radio access

- Evolution Metro
- NetLink
- Evolution Fibre

Nera Evolution



- Mast
- Fibrepoint
- Telenor/Norkringmast



PMP sectors

Harstad

Risøyhamn seen from Åseåsen



## Equipment

- One Evolution fibre hop 155 Mbit/s Fast Ethernet
- Nine Evolution hop 55 Mbit/s Fast Ethernet
- Nine base stations 12 Mbit/s sectors
- 9 switches
- Subscriber cost
  - from 300 to 600 Euro



Nera WiLink



# Hardanger Breiband



*Nera Evolution*

- Radio relay site
- Radio relay
- Passive reflector
- Fibrenode
- Municipality
- Fibre



# Broadband for everybody

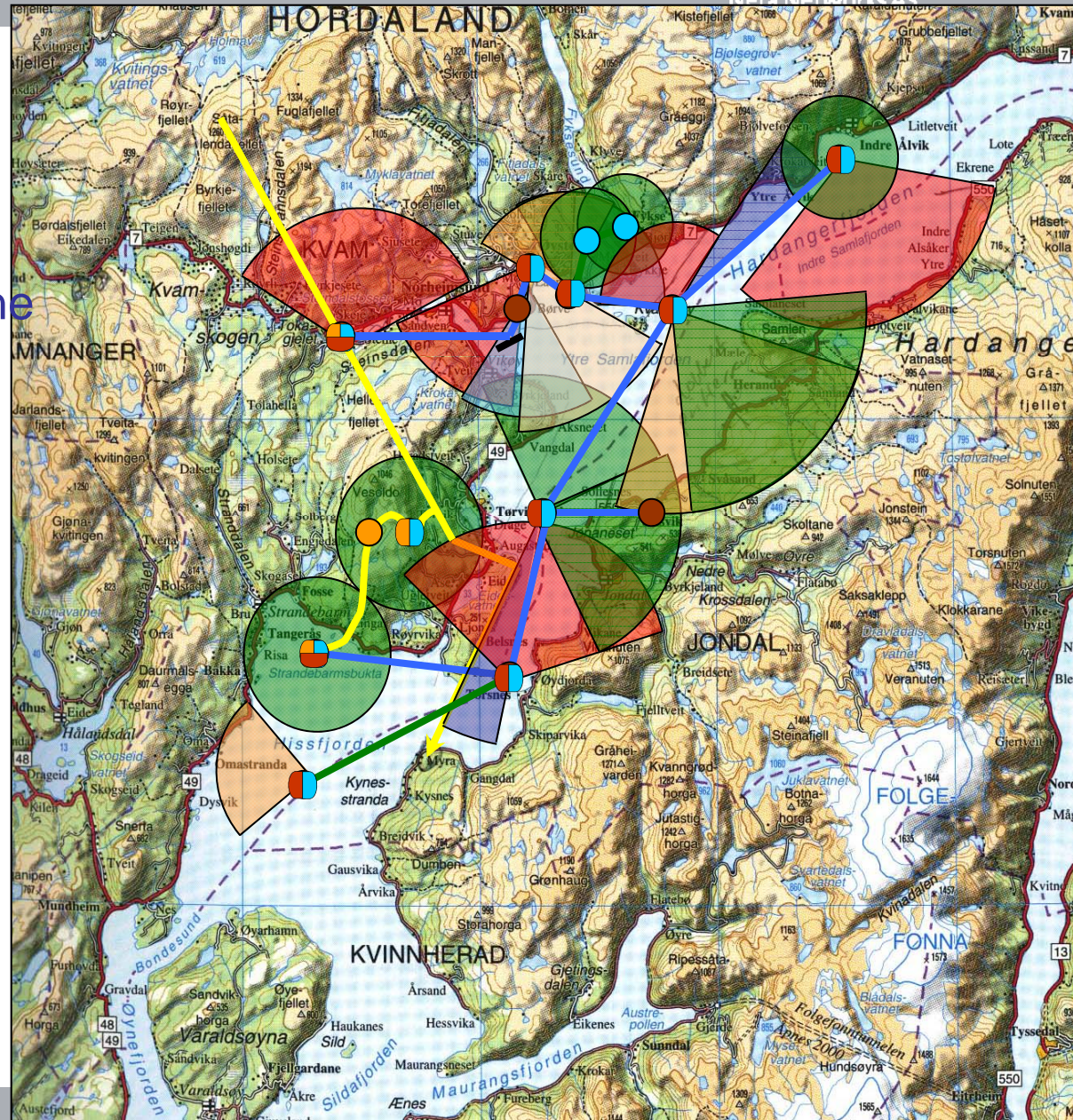
## Approach

- Locate fibre terminations
- Install microwave backbone
- Place the microwave connection to:
  - Feed WiMAX BS
  - Feed DSLAM switches
  - Feed local fiber

WiMax  
BS and CPE



Evolution  
microwave





# What about the abroad?



Nera has implemented FWA and WiMax in Norway, Sweden, UK, Denmark, Italy, Spain, Poland, Russia, Morocco, Mozambique, Jamaica and more





**Thank you for your attention**

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