APPENDIX – other MENA Country Case Studies

Broadband in MENA

- Fixed Broadband markets in MENA are largely 'underdeveloped'
  - with notable exceptions such as Qatar and UAE
- Mobile Broadband markets more developed
- Good potential international broadband connectivity
- Reasonable but patchy submarine connectivity MENA region
  - Egypt plays a pivotal role in North Africa and Oman as East – West gateway
- High cost of deployment and yet most countries in region have large amounts of dark fibre and 'poles and holes' owned by existing utilities (and incumbent telcos)

Country Case Studies
Morocco (1)

- 2004 Law obliges sharing of telecoms' infrastructure
- Backbone connectivity addressed by leveraging 'passive infrastructure sharing' & 'deployment of own infrastructure
- Three infrastructure operators provide backbone capacity:
  - two utility companies (railways and electricity grids); and
  - one passive infrastructure provider
- Two utility companies bound by exclusive agreements –
  - railways (Office Nationale des Chemins de Fer, ONCF) with Méditel (30-year contract: 2005–35)
  - electricity grids (Office National de l'Electricité et de l'Eau Potable, ONEE) with Wana-INWI.

Country Case Studies
Morocco (2) - ONCF & ONEE

- ONCF's and ONEE' infrastructure have different geographical coverage
- Complement each other
- Usage of each infrastructure is limited to one operator
- Neither of the two backbone networks would be available to new entrant

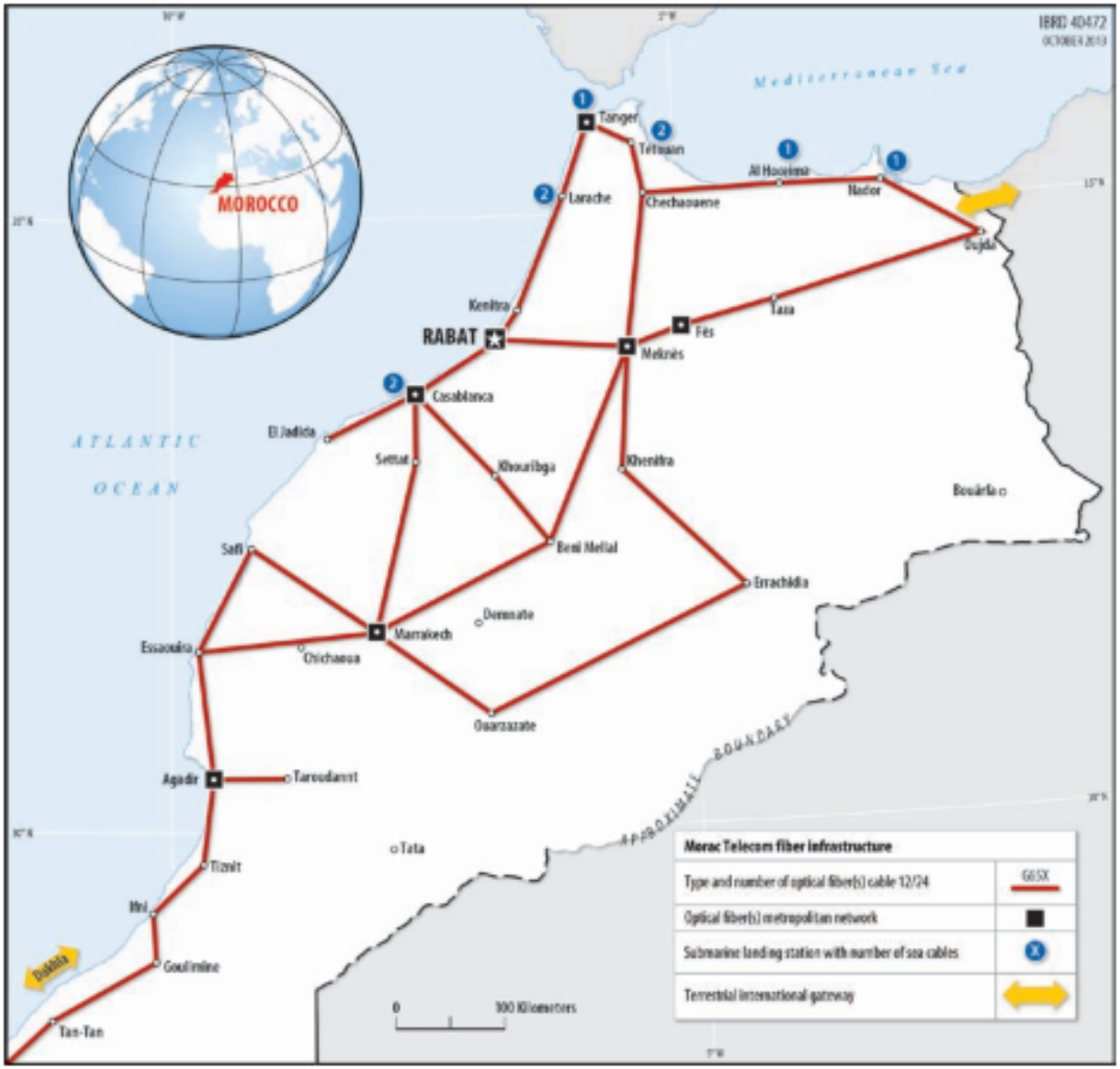
Country Case Studies
Morocco (3) – Finetis Maroc

- Third provider – Finetis Maroc
- Legal status and rights not currently clear
- Infrastructure deployed mainly on land of Autoroutes du Maroc (ADM)
- Consists of large capacity of fiber-optic cables (72 cable pairs) to be leased as dark fibre to operators
- Also, deployed infrastructure along other roads and metropolitan networks

Country Case Studies
Morocco (4)

MAROC TELECOM

Red – Type and Number of optical fiber(s) cable 12/24

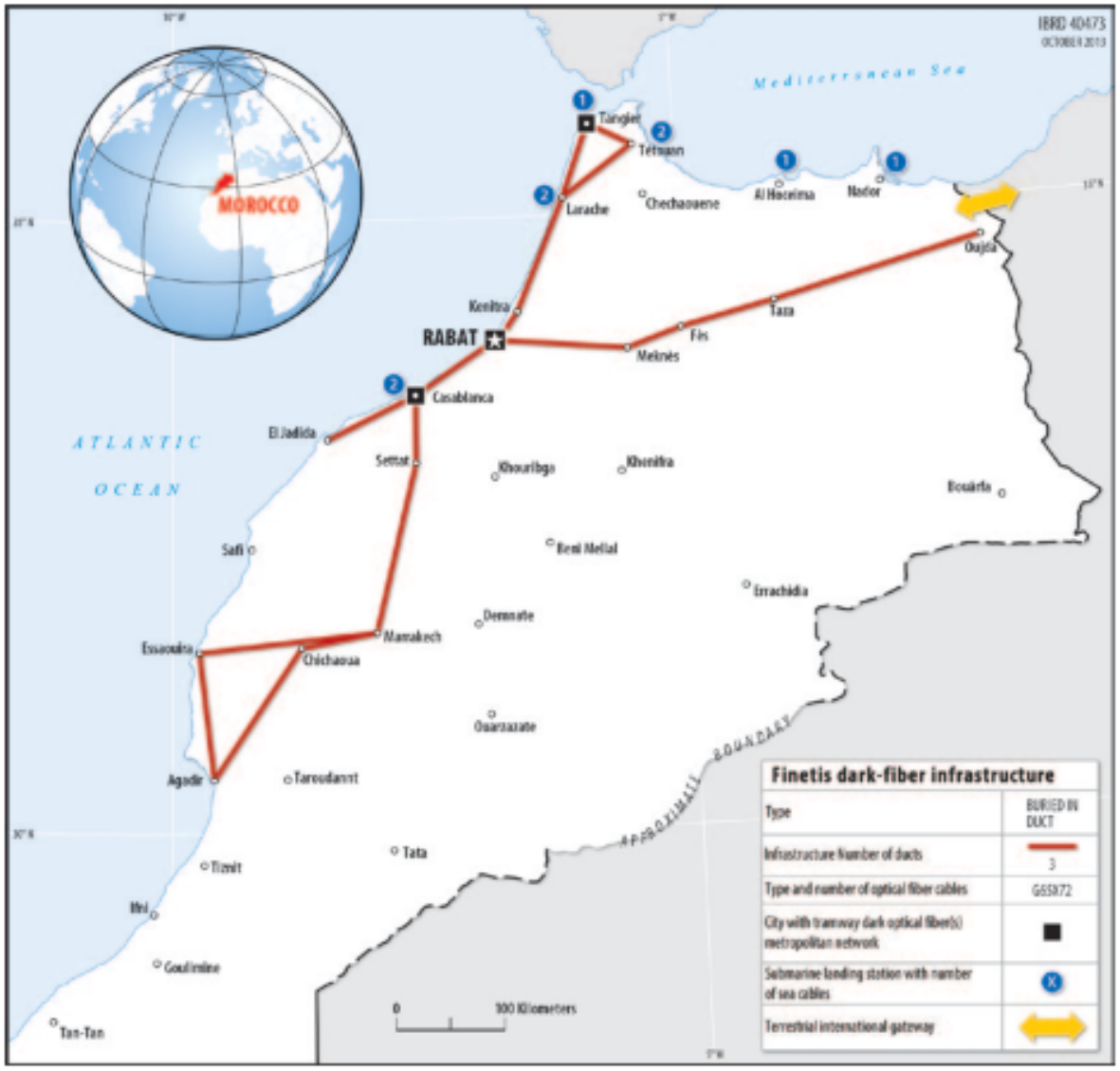


Source: World Bank.
Note: ADM = .

Main Links of Maroc Telecom's National Fiber Backbone

Country Case Studies
Morocco (5)

FINETIS TELECOM – 2ND FIXED OPERATOR
Red – Infrastructure Number of ducts (3 ACTIVE)



Main Links of Finetis Telecom's National Fiber Backbone

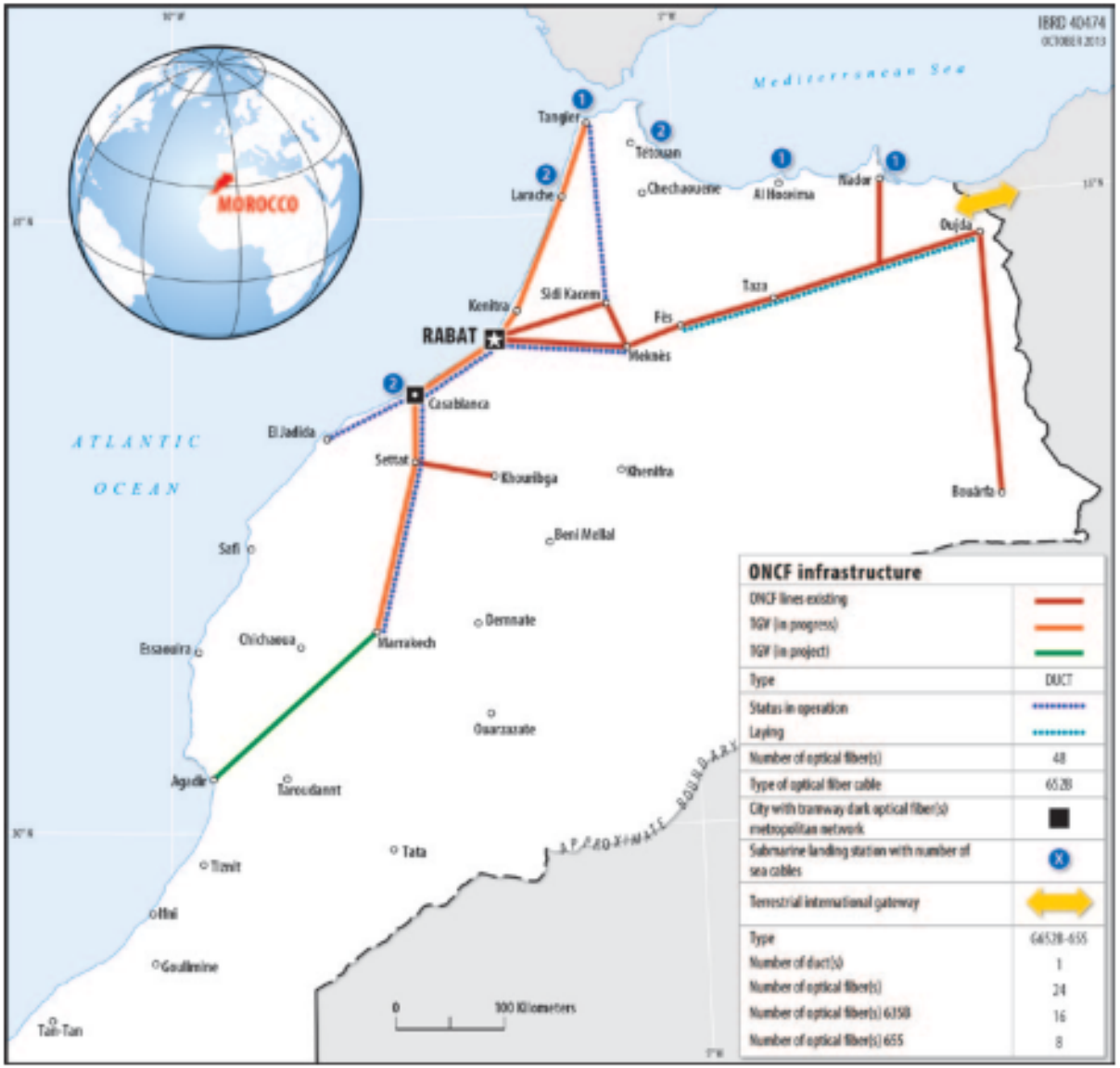
Country Case Studies
Morocco (6)

ONCF – National Railroad Company

Red – Existing Lines

Orange - In progress

Green – In project



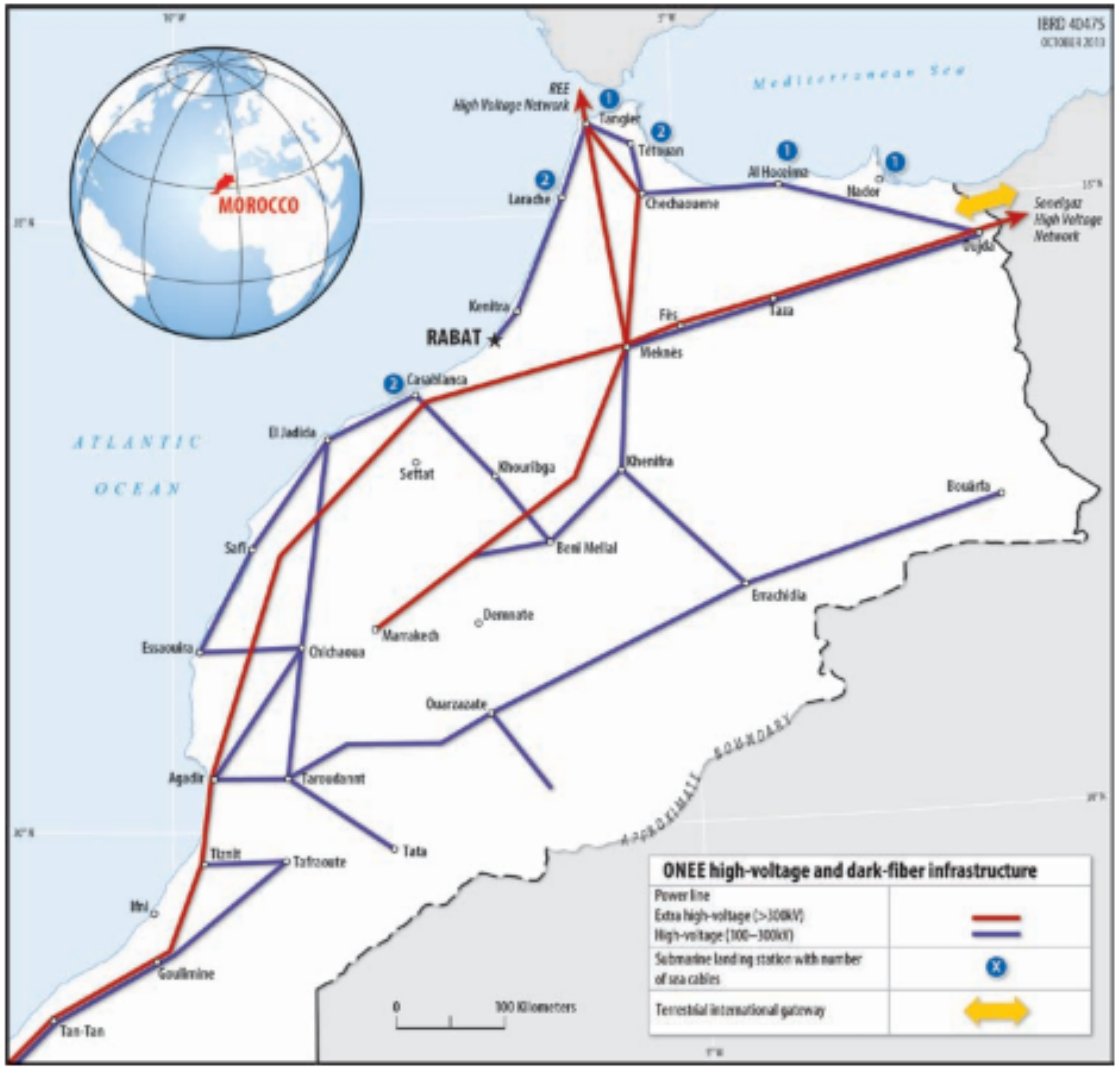
Key Characteristics of ONCF' Fibre-Optic Infrastructure

Country Case Studies
Morocco (7)

ONEE – Office National de l'Electricite et de l'Eau Potable

Red – Extra high-voltage (>300kv)

Blue - High-voltage (100-300kv)



Note: kV = kilovolts; ONEE = Office National de l'Electricité et de l'Eau Potable.

Key Characteristics of ONEE's Fibre-Optic Infrastructure

Country Case Studies
Tunisia (1)

- Backbone connectivity being addressed by 'passive infrastructure sharing' and 'deployment of own infrastructure'.
- Telecom's Law not define rights of alternate infrastructure providers – now under review
- Despite number of alternative infrastructure providers, only one is proactive and open to any operators' request.
- Three major providers –
  - Tunisian Electricity and Gas Company (STEG);
  - Tunisian Railways National Company (SNCFT); and
  - Highways - Tunsie Autoroutes

Country Case Studies
Tunisia – (2) SNCFT

- SNCFT –
  - Rail company has network based on synchronous transmission mode (STM)-16 to manage operations & strategy
  - Most advanced in commercial uses of excess fibre infrastructure
  - Use of its network is proactive and open to operators' request
  - Extensive collocation facilities

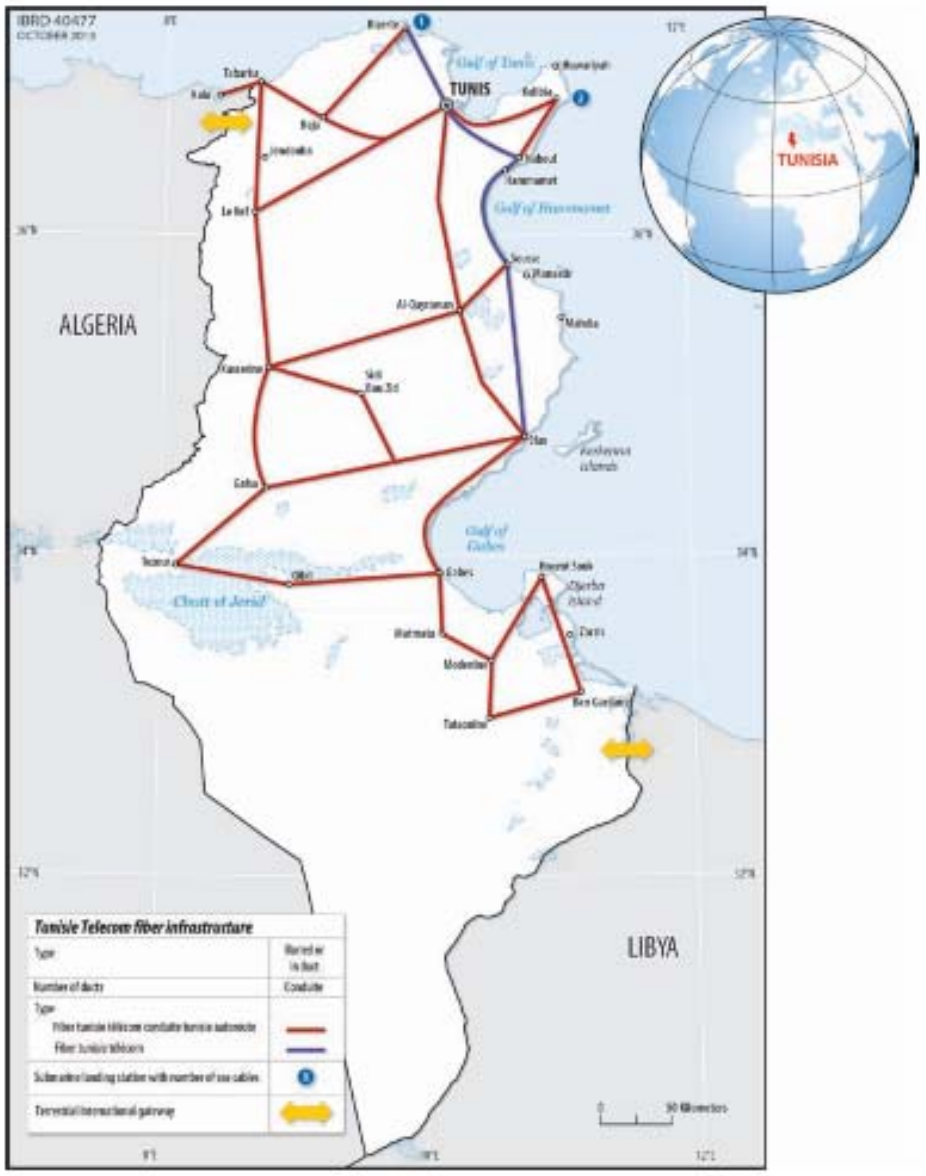
Country Case Studies
Tunisia – (3) STEG & Tunisie Autoroutes

- STEG –
  - 2,700 kilometres of optical fibre
  - to manage high voltage and extra high voltage distribution
  - not yet leased excess capacity
- Tunisie Autoroutes –
  - 3 pipes laid to deploy optical fibre cables on 435 kms of its highways
  - None contain its fibre
  - Conservative strategy; and
  - Exclusive deal with Tunisie Telecom

Country Case Studies
Tunisia (4)

Red – Fibre Tunisie Telecom ducts of Tunisie Autoroute

Blue – Fibre Tunisie Telecom



Main Links of Tunisie Telecom's National Fiber Backbone

Country Case Studies
Tunisia (5)

SNCFT - Société Nationale des Chemins de Fer Tunisiens

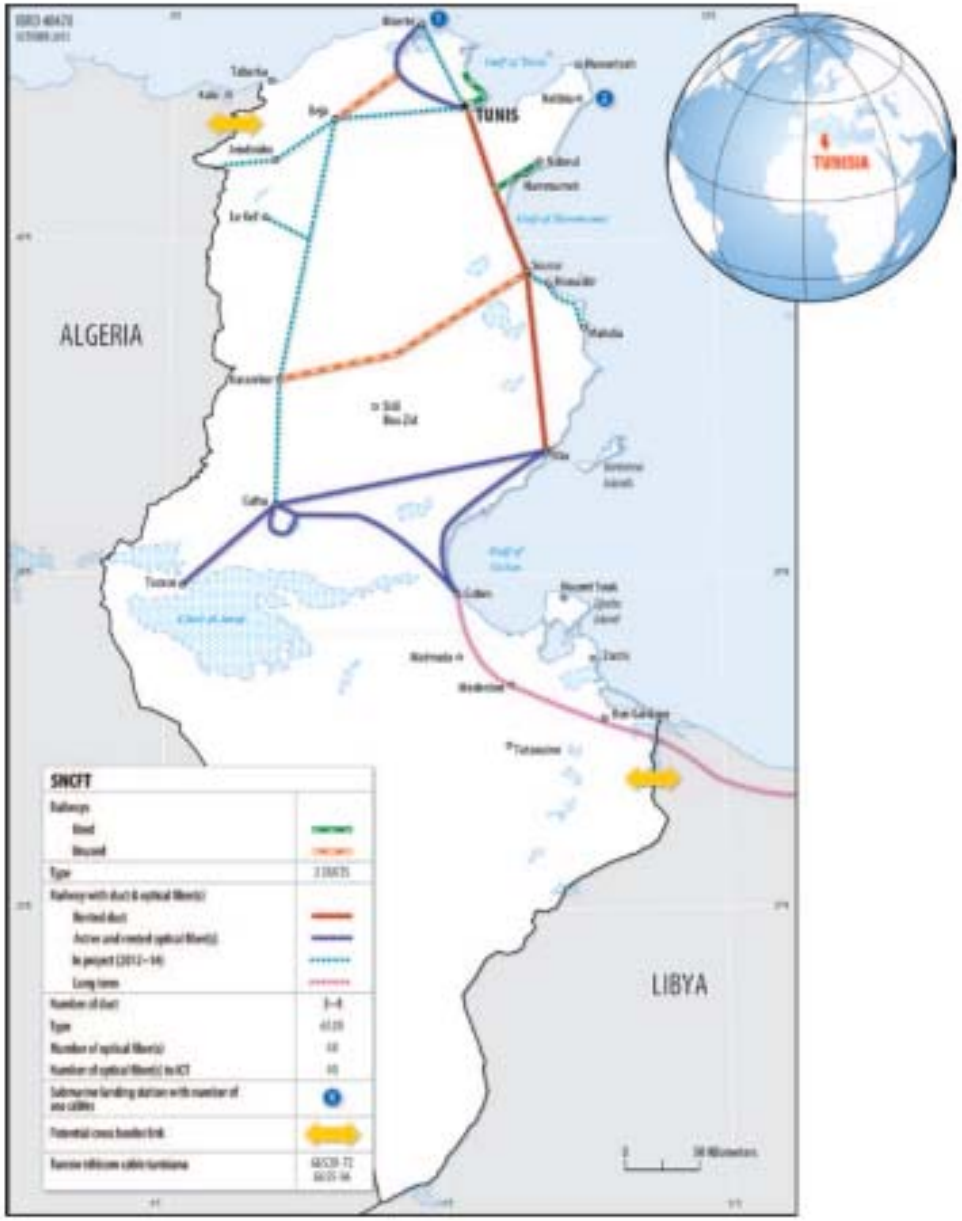
Railway with duct & optical fiber(s)

Red – Rented duct

Blue – Active and rented optical fiber(s)

------- In project (2012-14)

-------- Long term



Key Characteristics of SNCFT Fibre-Optic Infrastructure

Country Case Studies
Tunisia (6)

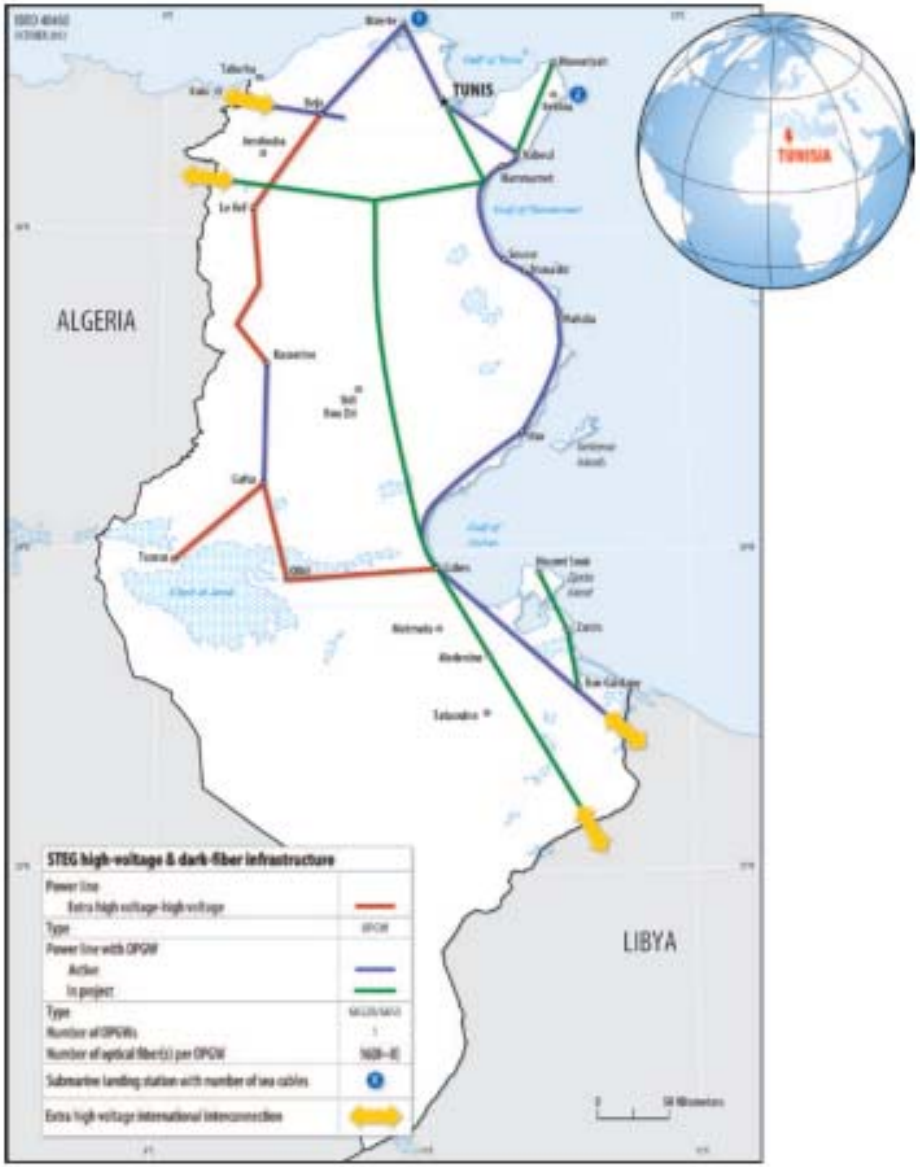
STEG- National Electricity and Gas Grid

Power line

Red – Extra high voltage-high voltage duct

Blue – Active Powel line with OPGW

Green - In project



Key Characteristics of STEG's Fibre-Optic Infrastructure

Country Case Studies
Jordan (1)

- No policy/regulatory impediments to implementation and use of alternative infrastructure
- Utility networks have excess capacity available to licensed telecommunications operators and for private networks
- Tariff regulation necessary to ensure resources are accessible at feasible price
- Civil works requirements for new ducts, masts and new utility build avoiding exclusive arrangements

Country Case Studies
Jordan – (2) NEPCO

National energy supplier, National Electricity Power Company (NEPCO) equipped large number of high voltage and extra high voltage lines with fibre-optic cables

- Covers most of the country and reaches large and medium sized cities
- Provides a metropolitan network in Amman
- This can be used for backhaul networks
- Current pricing of network not attractive to operators
- Requires tariff regulation

Country Case Studies
Jordan – (3) JTG

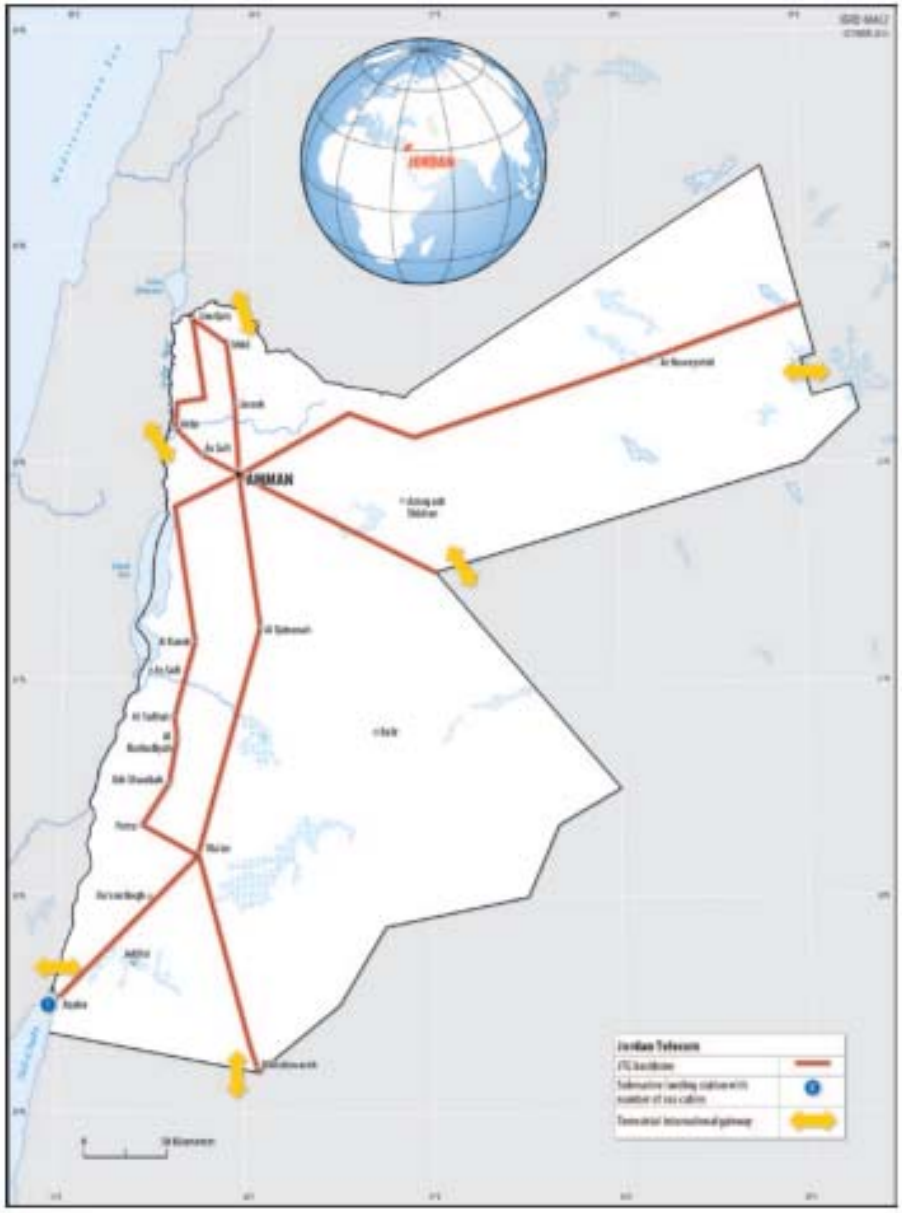
- Legal & regulatory framework – no 'bottlenecks'
- Jordan Telecom Group (JTG) – backbone infrastructure covering large part of territory
  - infrastructure available on wholesale basis to other operators
- For utility's own use and ability to rent passive infrastructure without authorization
- For implementation and use of alternative infrastructure and international gateways

Country Case Studies
Jordan – (4) NBN

- Adopted universal service in 2004 to ensure affordability and availability of basic services to all
- Ministry of Information and Communications Technology sponsored an open broadband network in 2004 connecting schools, government premises, hospitals etc
    - reach underserved areas as well
    - own build along Amman-Aqaba Highway
    - leases capacity from NEPCO, JIPCO, EDCO and IDCO
    - leases ducts to others

Country Case Studies
Jordan (5)

Red – JTG backbone



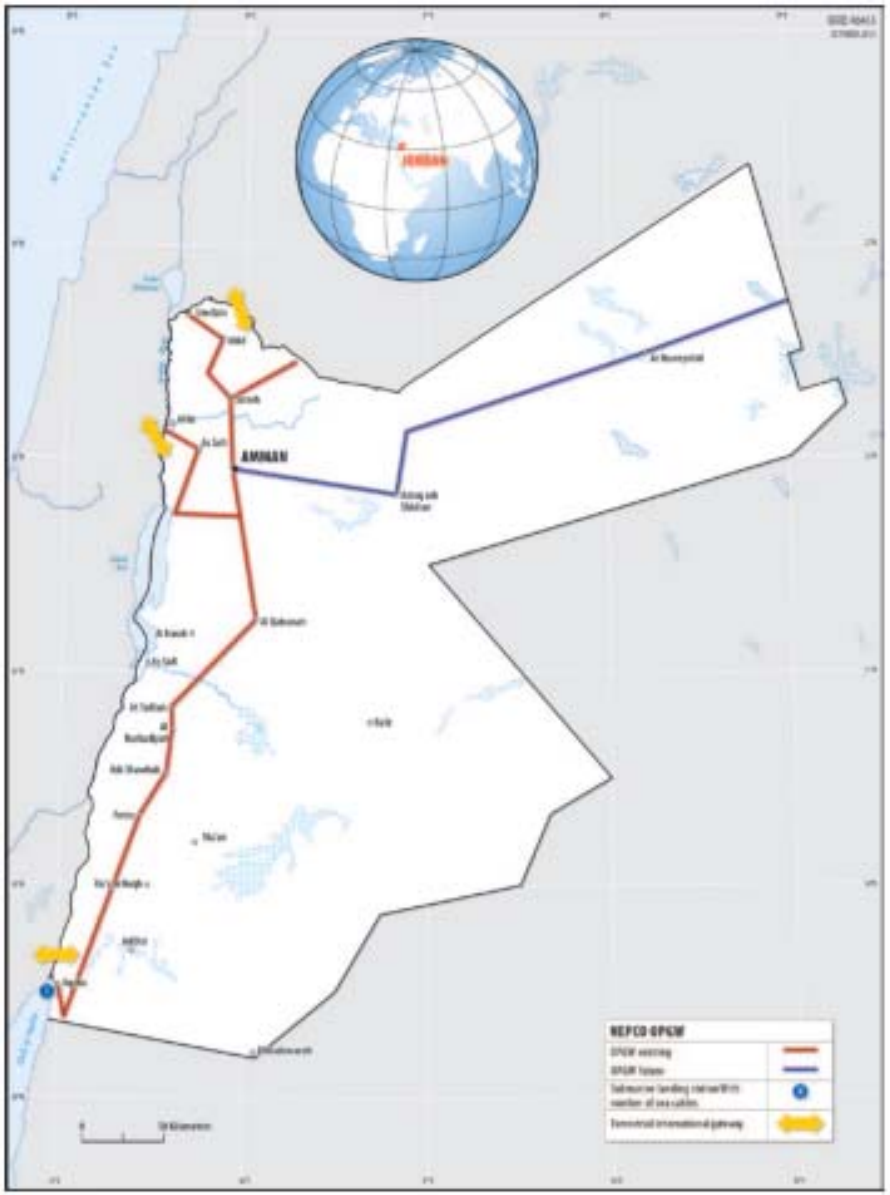
Main Links of Jordan Telecom's National Fiber Backbone

Country Case Studies
Jordan (6)

NEPCO- National Electricity Power Company

Red – OPGW existing

Blue – OPGW future



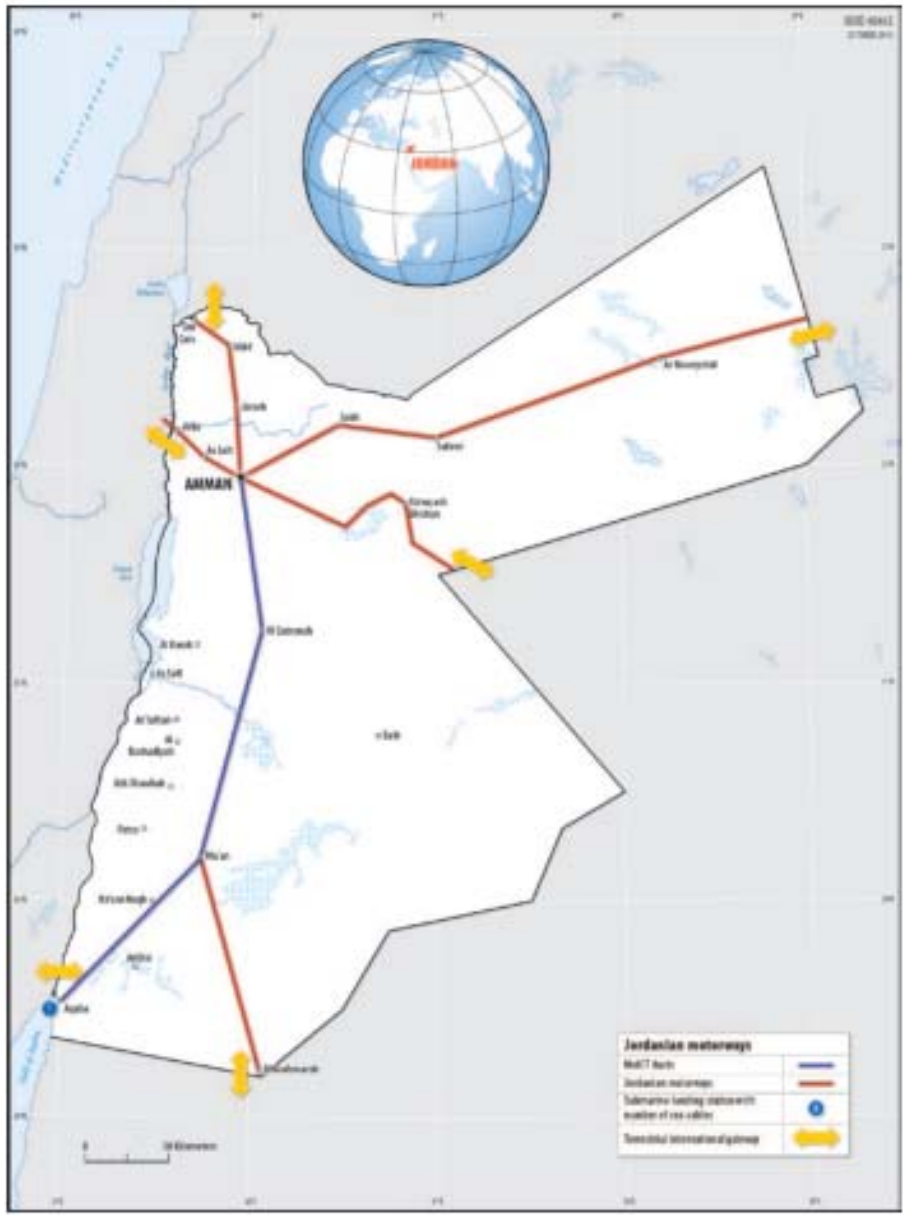
Key characteristics of NEPCO's Fiber-Optic infrastructure

Country Case Studies
Jordan (7) - NBN

NBN- National Electricity Grid

Red – Jordanian motorways

Blue – MoICT ducts



Key characteristics of NBN's Fiber-Optic infrastructure