How to develop a sustainable intermodal network in West Africa?

Intermodal AFRICA 2021

Accra, 27. October 2021 | Christoph Schoppmann, Senior Project Manager at HPC

HPC

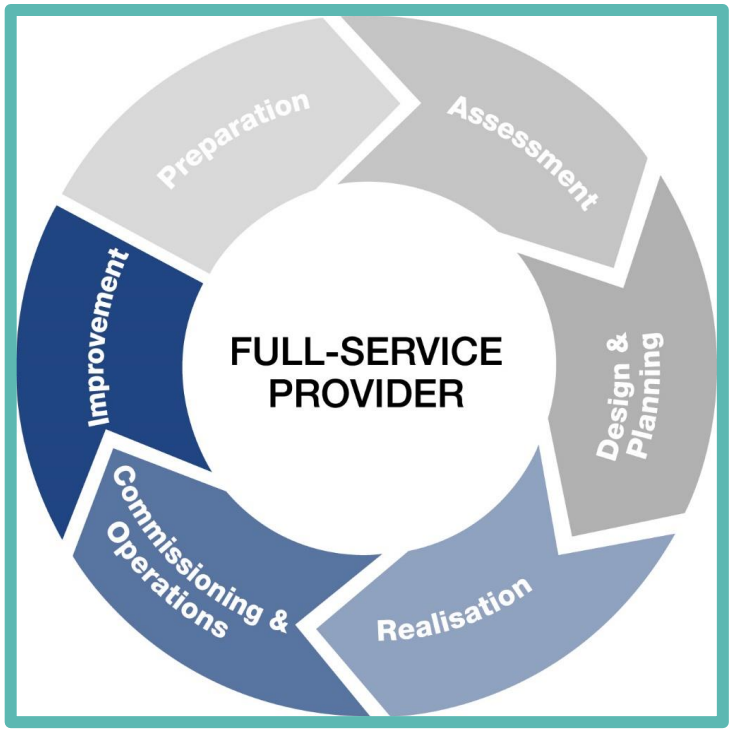
Agenda

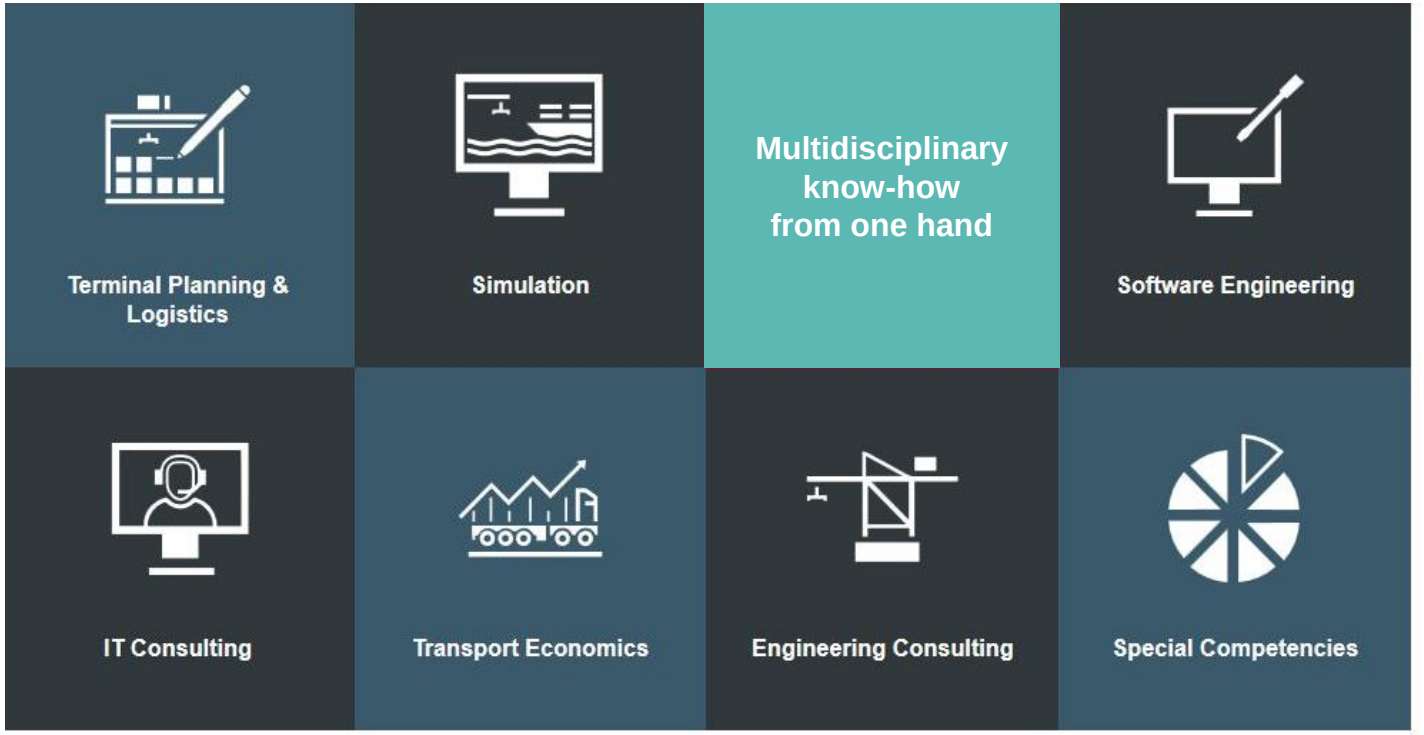
What are we going to look at today?

- **HPC Hamburg Port Consulting in the Intermodal Sector**
- Background
- Different Rail Networks & Implications to West Africa

Our Expertise

Wide range of services from one competent provider





- Founded 45 years ago by the biggest terminal operator in the port of Hamburg (~7.5m TEU per year)
- Aiming to provide the knowledge and expertise to the world and grow relationships to the Port of Hamburg.
- Starting from a port-centric approach, we are now also one of the industry's most respected rail consultants.

Intermodal Rail Expertise at a Glance

Ensuring efficient terminal and network operations

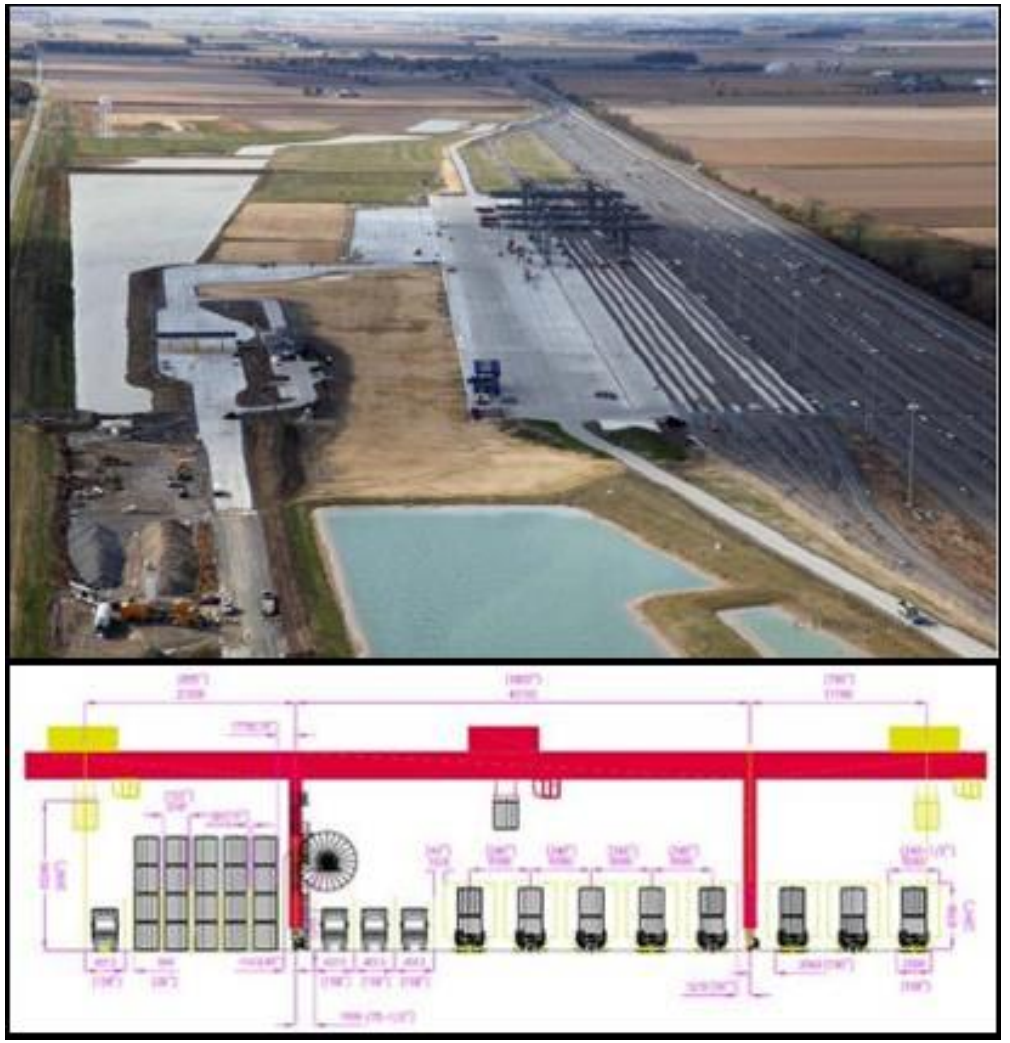
- Over 60 projects for the development and simulation of rail terminals, networks and related facilities

Reference Project

Development of an Intermodal Hub Terminal in North Baltimore, Ohio (USA)

CSX Intermodal Terminals, Jacksonville, FL

- Terminal design and operations planning
- Crane performance assessment and selection of horizontal transport system
- Simulation of terminal operations, dynamic analysis of terminal design, equipment and performance
- Elaboration of detailed crane specifications & technical evaluation of proposals from manufacturers
- Definition and description of operations process
- Procurement assistance for TOS (Terminal Operating System)



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What is the situation?

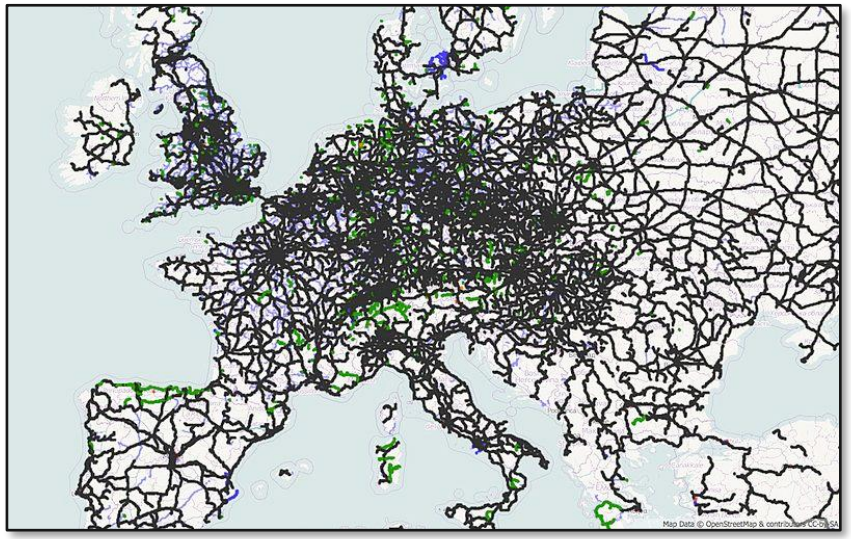
Comparison of existing rail infrastructure shows significant regional differences

Africa

Area: 30m km²
Rail network: around 70,000 km

= 1 km rail per 430 km²

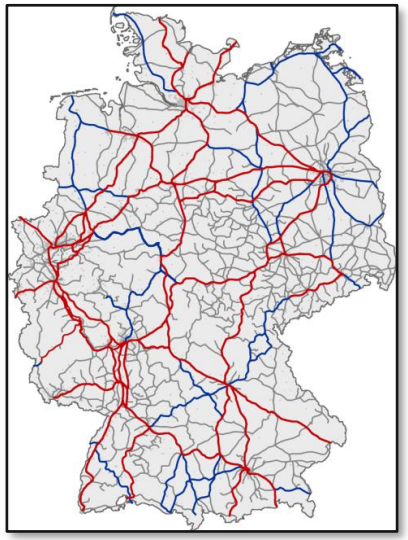
Europe



Area: 4.5m km²
Rail network: around 220,000 km

= 1 km rail per 20 km²

Germany



Area: 355’ km²
Rail network: around 40,000 km

= 1 km rail per 9 km²

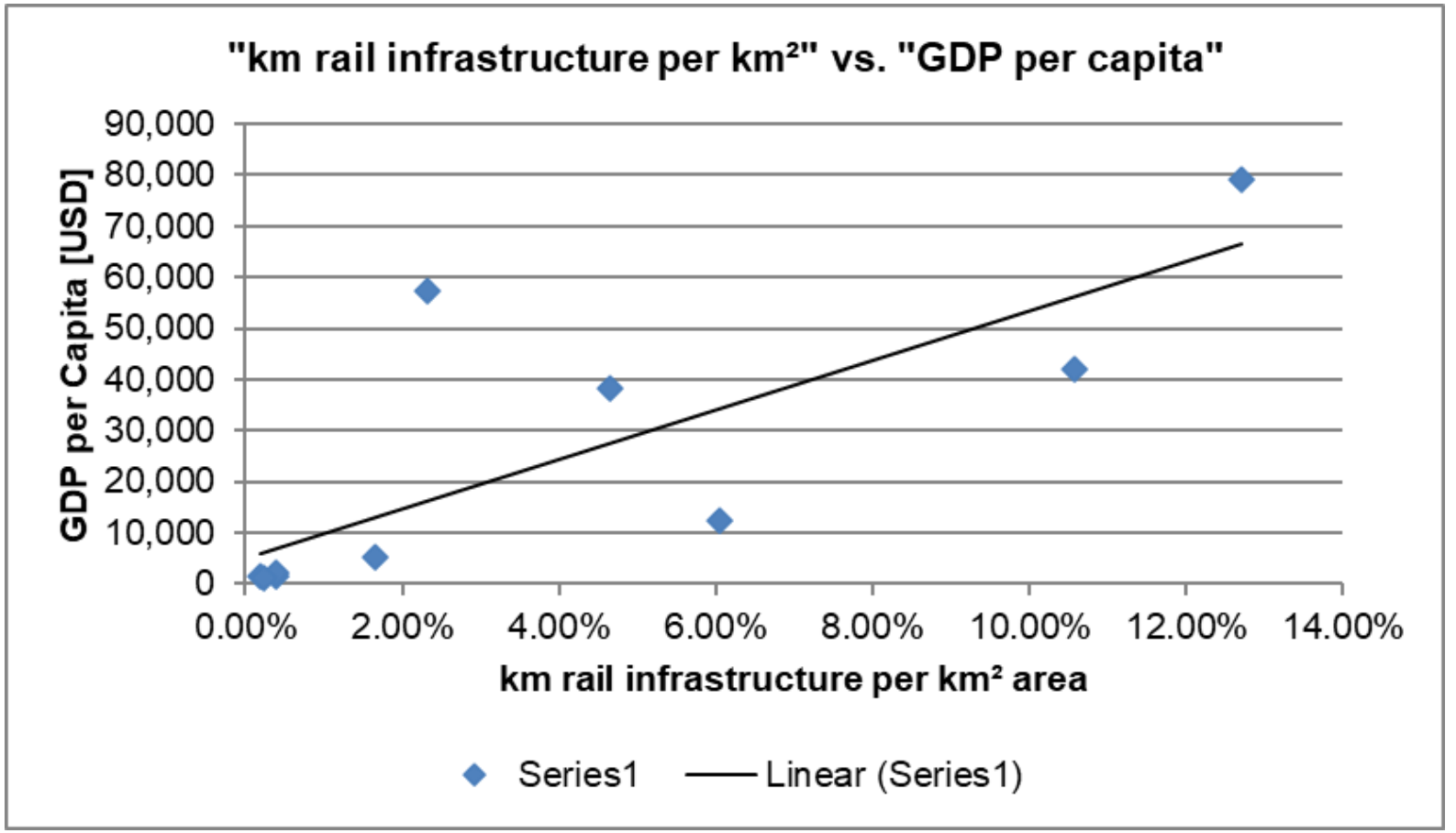
→ **Rail infrastructure in Europe has a very high density, historically grown in each country!**

→ **But: Europe has developed a rail <u>network</u>, connecting the different countries and regions!**

Exemplary rail network of a railway undertaking

Metrans rail network connecting more than 10 countries

Why does it matter?



→ **Clear correlation between GDP per capita and existing rail infrastructure!**

Agenda

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What is this?

exemplary situation

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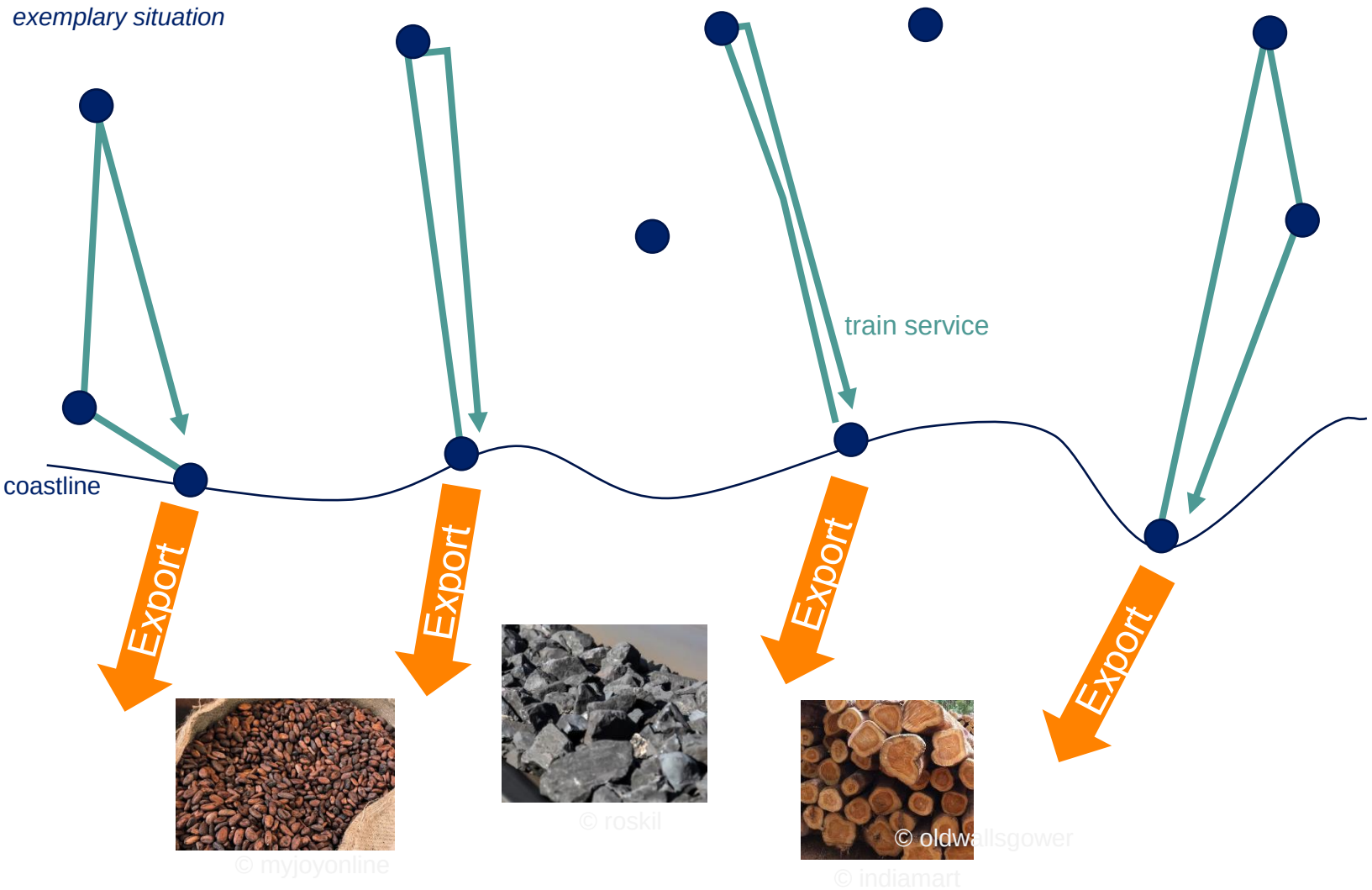
- Production centres
- Consumption areas
- Mineral resources
- Raw materials
- Etc.

→ **Areas where people live and work!**

→ **Areas where value is created!**

What do we see now?



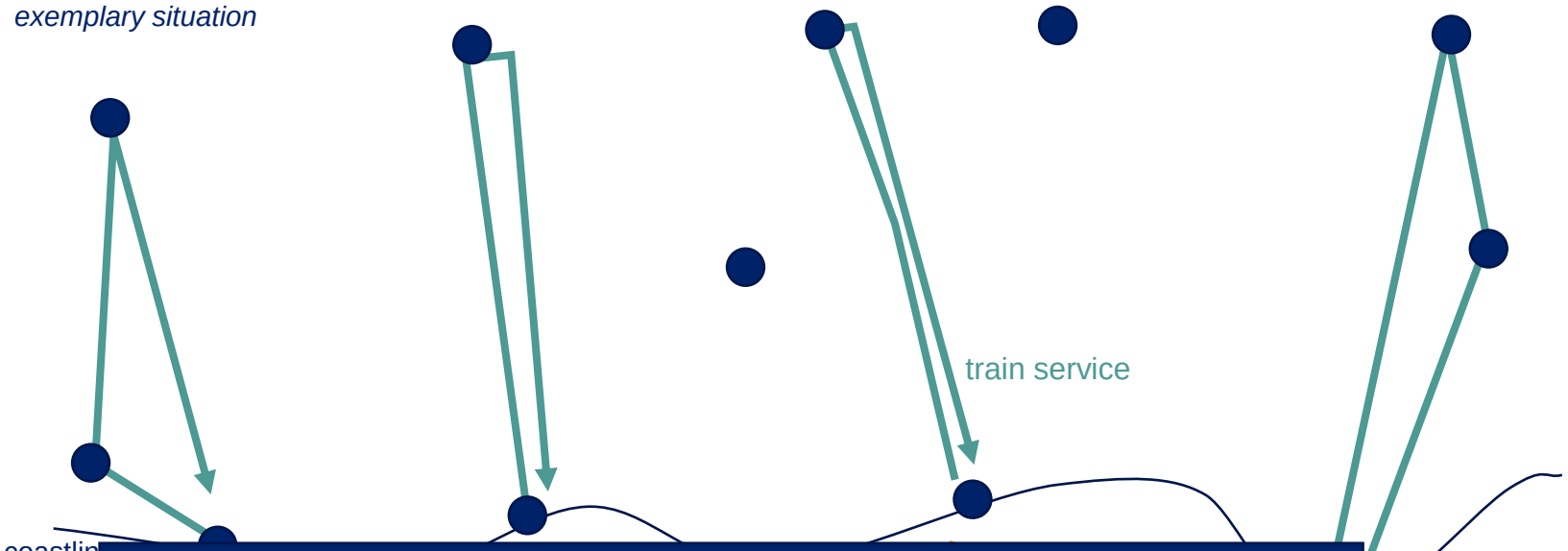
- Rail infrastructure as it used to be built in the past.
- No rail **network**, but individual connections.
- Could be linking production and consumption areas.

→ **Not designed to connect agglomerations, people and businesses!**

→ **Mainly designed to support export of raw materials!**

What do we see now?

exemplary situation



Very simplified:
Exporting Cocoa and getting back this…

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- No rail **network**, but individual connections.
- Could be linking production and consumption areas.

→ **Not designed to connect agglomerations, people and businesses!**

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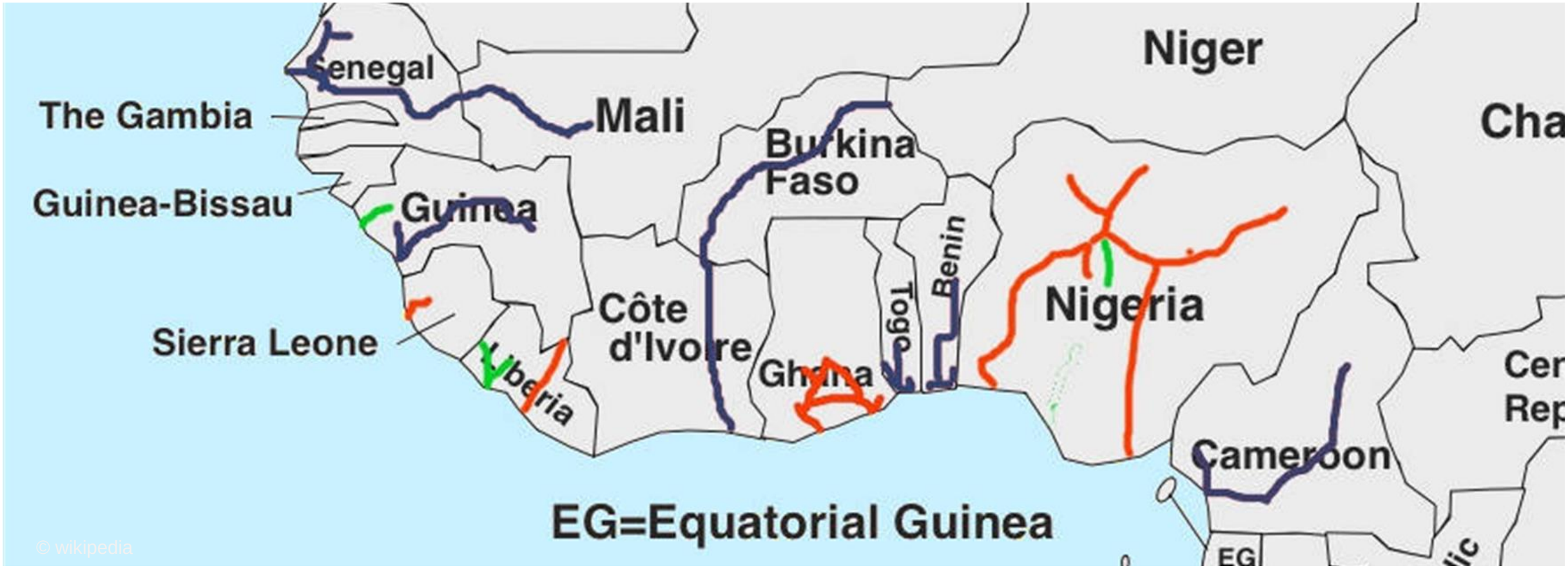
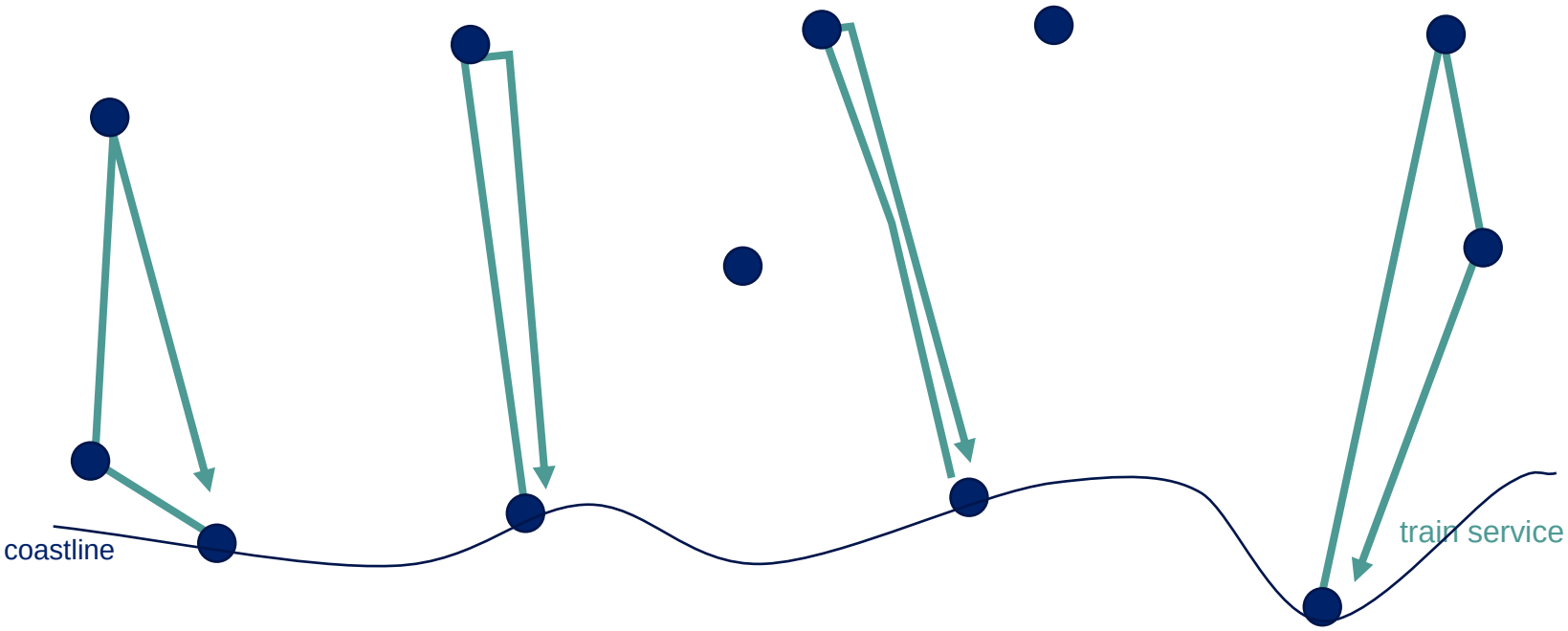
This looks pretty similar, right?



→ **Current rail infrastructure in West Africa is reflecting this historically grown approach!**

→ **Need to consider an actual rail <u>network</u> for the region as whole to connect and develop!**

What’s the potential for trade development?



- Initial situation is using 4 train services to connect:
  - 3 locations
  - 2 locations
  - 2 locations
  - 3 locations

  → **8 individual connections**

  → **2 locations not connected at all**

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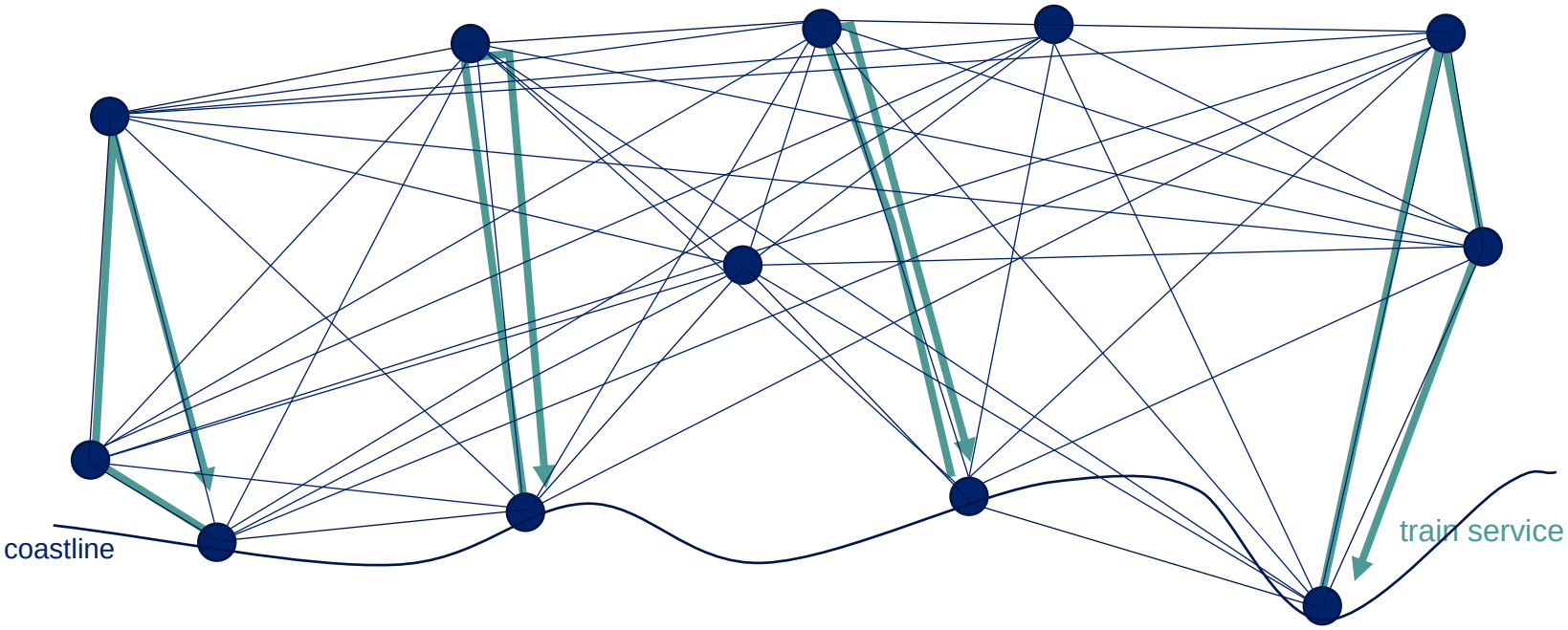

- Initial situation is using 4 train services to connect:
  - 3 locations
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  - 2 locations
  - 3 locations

  → **8 individual connections**

  → **2 locations not connected at all**

- Theoretical number of connections between locations

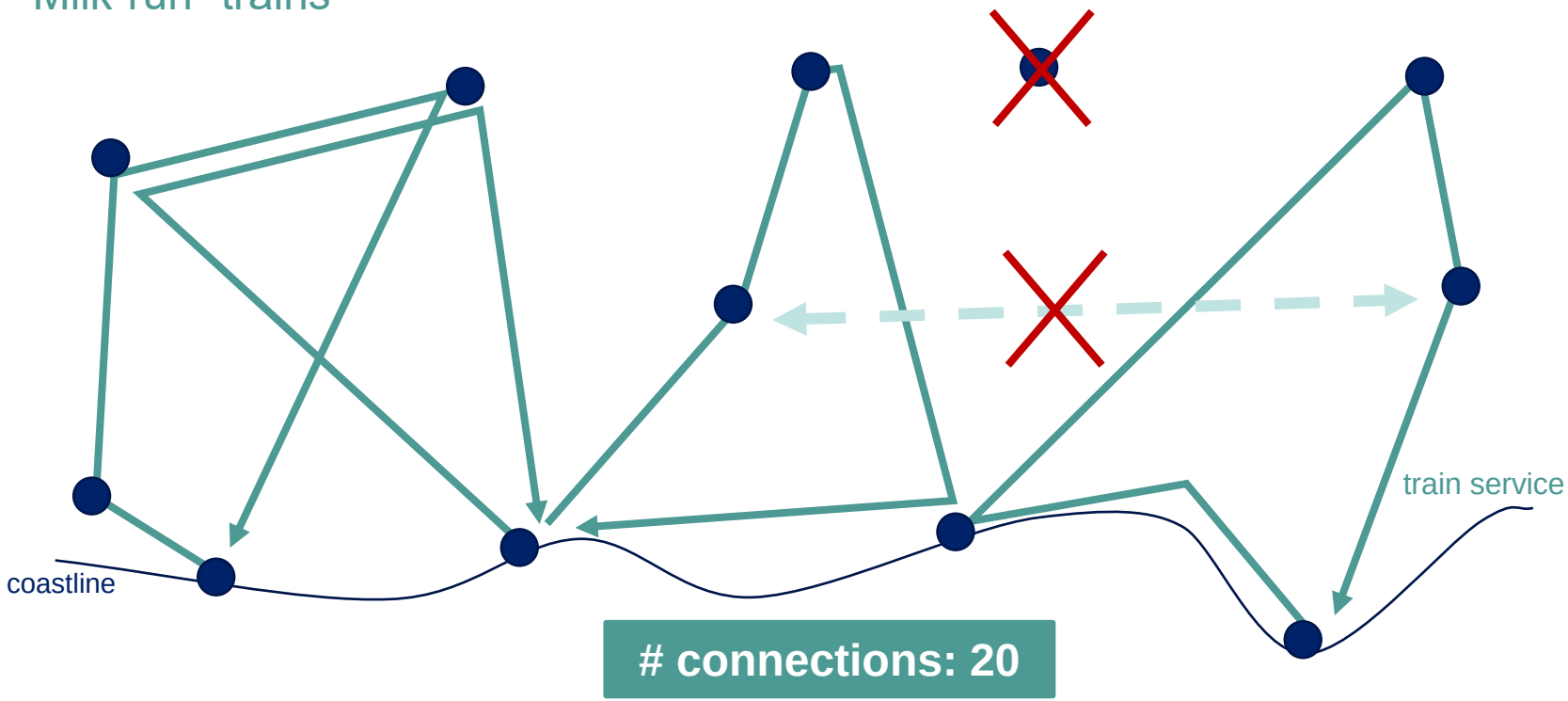
  → **66 potential connections**

→ **Substantially more opportunities to connect people and businesses!**

→ **Facilitating exchange and trade opportunities!**

How can it be done?

"Milk-run" trains



Characteristics:

- Long train travel times.
- Requires high sorting efforts in the ports.
- Possibly issues with reliability of schedules.
- Requires very precisely synchronized train movements.

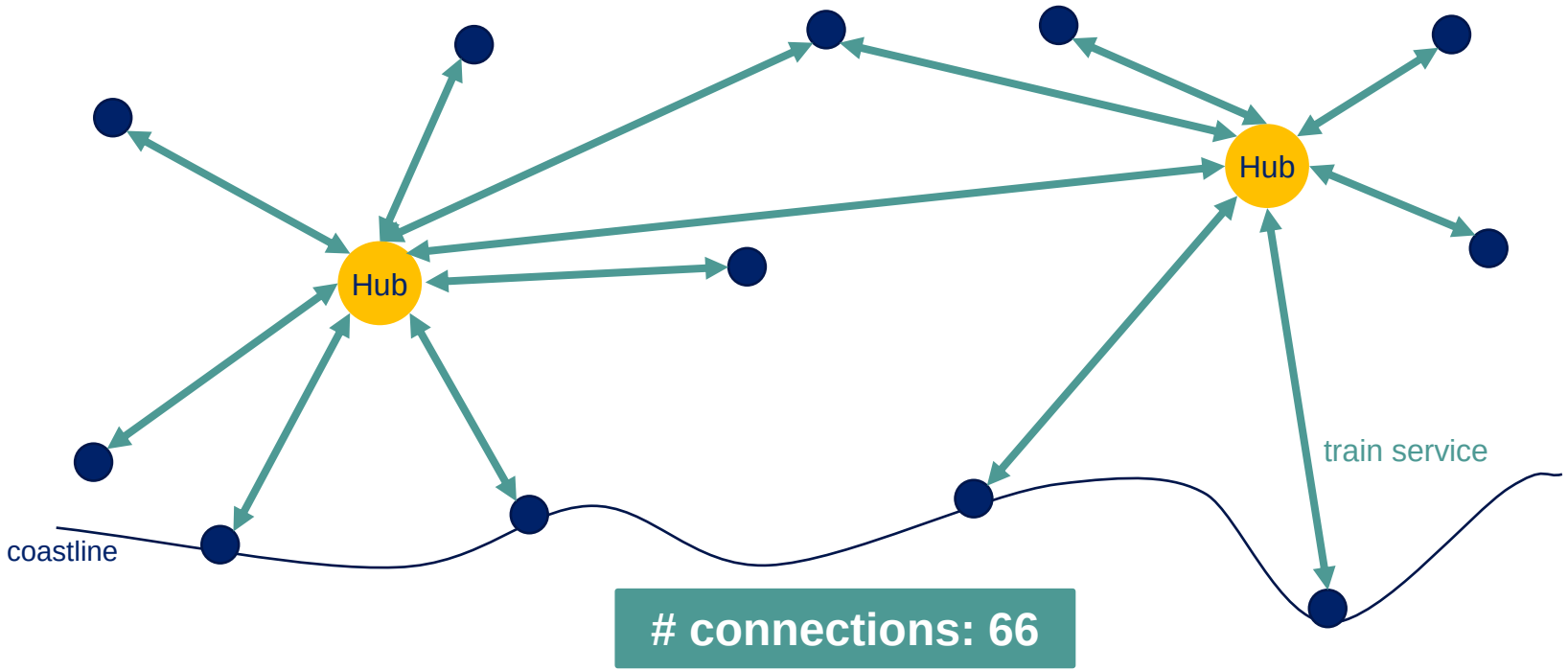
→ **Train building can be very challenging and time consuming.**

→ **Some markets are not served due to lack of volume.**

→ **Not connecting the hinterland locations, missing opportunities to combine volumes.**

How can it be done?

Hub Network



 # connections: 66

Characteristics:

- Higher train frequency possible due to volume consolidation. → **shuttle trains** between ports & hub terminals and hub terminals & local terminals.
- Sorting efforts in port reduced.
- More locations served.
- Likely less schedule deviations.

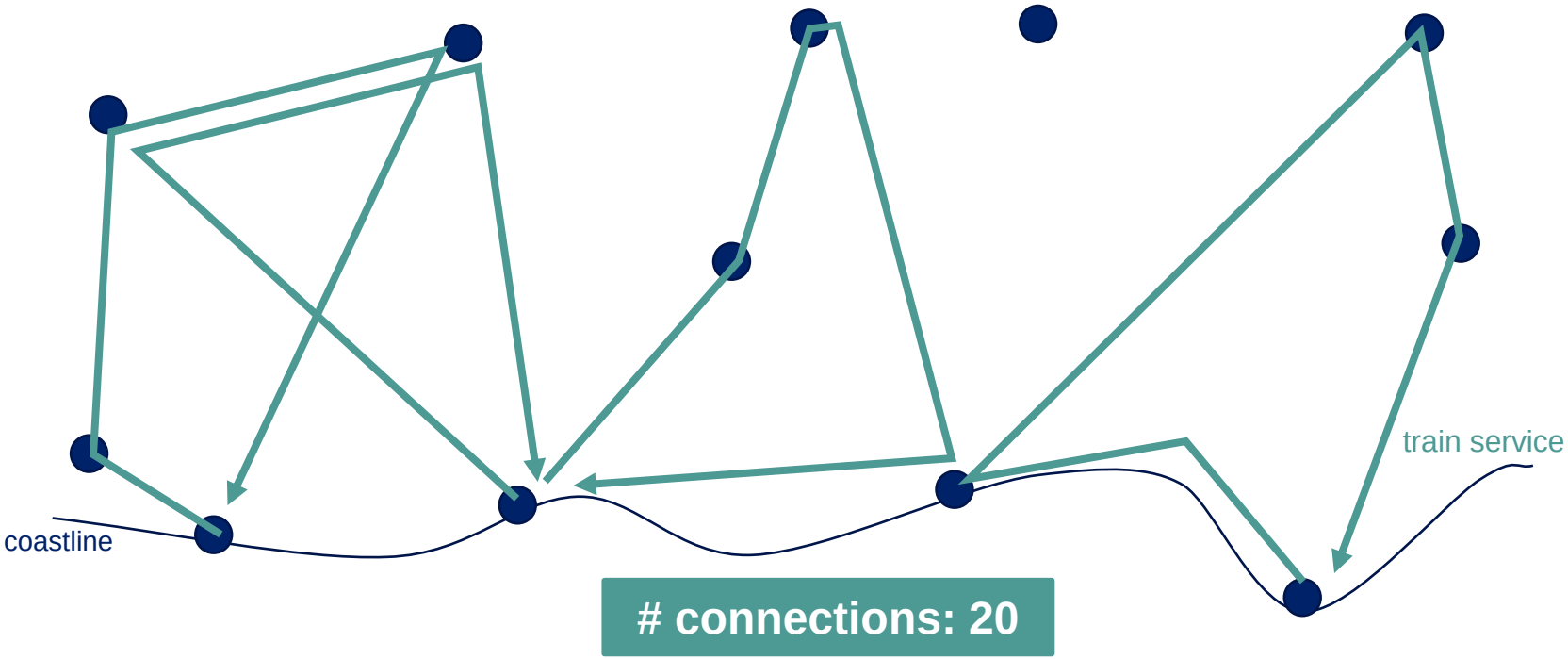
→ Higher train frequency can reduce dwell time in port.

→ Train building can be performed more efficiently, leads to higher capacity.

→ Connecting locations and consolidating volumes leads to increased market potential.

Can it be applied to West Africa?

Some exemplary numbers and considerations

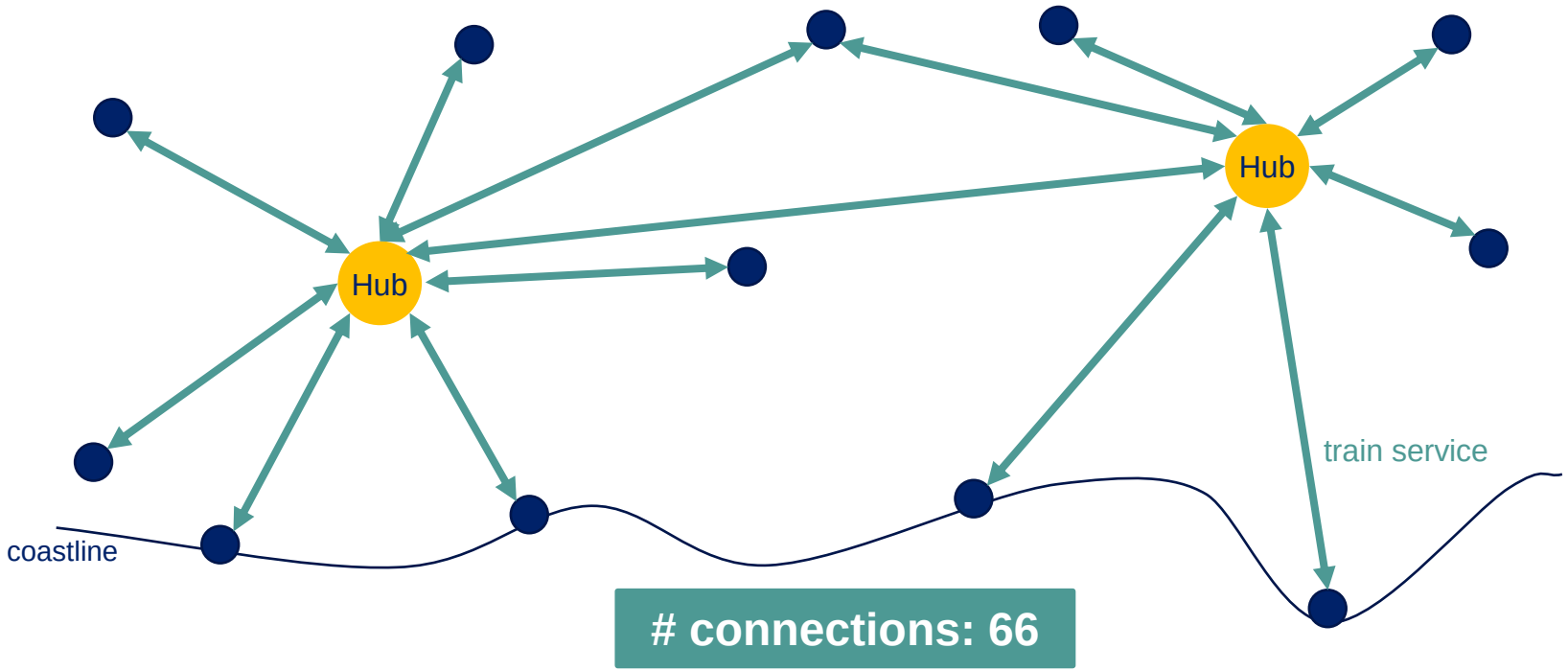


Observations:

- Volumes for individual locations likely too low for regular shuttle trains to the ports.
- Invest in rail network to connect individual locations harder to pay off, due to limited volumes.

Can it be applied to West Africa?

Some exemplary numbers and considerations



Observations:

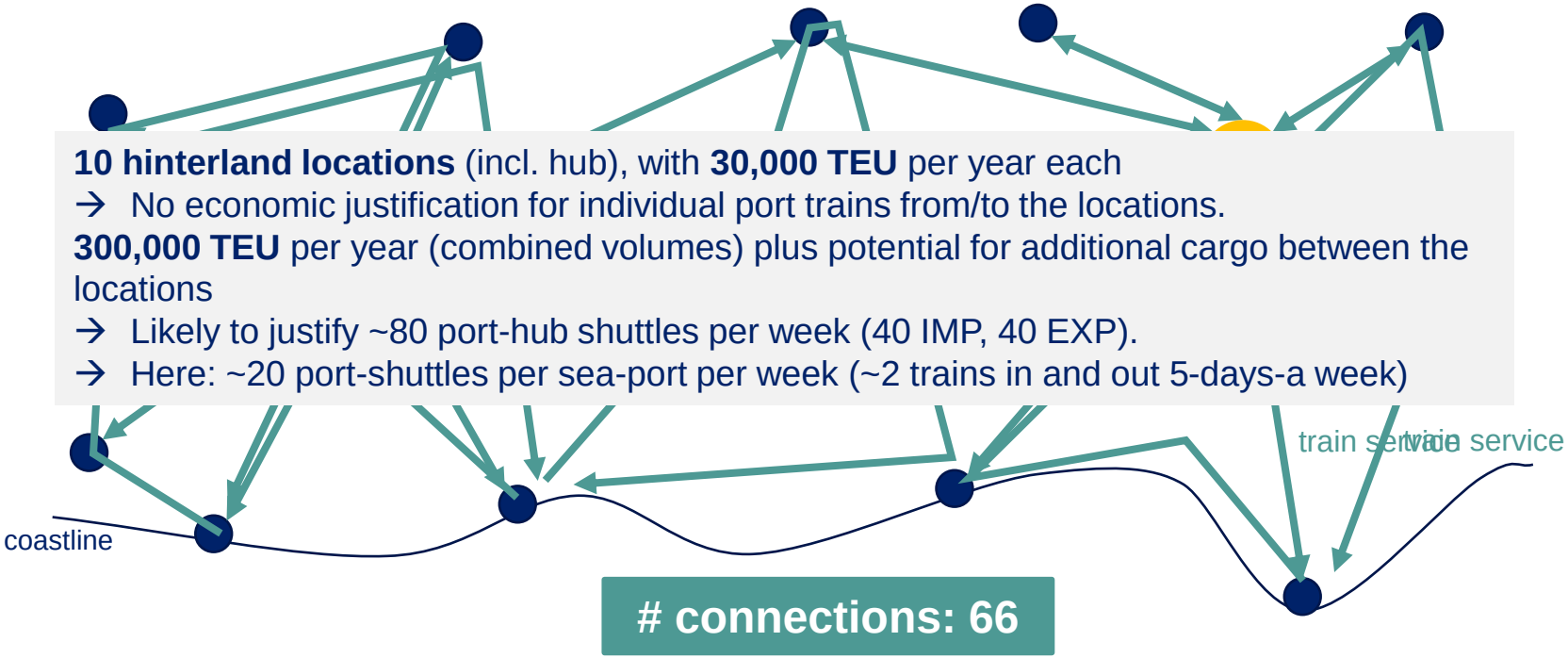
- Volumes for individual locations likely too low for regular shuttle trains to the ports.
- Invest in rail network to connect individual locations harder to pay off, due to limited volumes.
- Hub system facilitates trade **between** the different locations in the system, not only with the "rest of the world".

→ Efficient rail networks increase **reliability** and **reduce cost** in the supply chain for the benefit of all!

→ Development of a **true transborder intermodal network** offers opportunities to further develop the West African economies!

Can it be applied to West Africa?

Some exemplary numbers and considerations



10 hinterland locations (incl. hub), with **30,000 TEU** per year each
→ No economic justification for individual port trains from/to the locations.
300,000 TEU per year (combined volumes) plus potential for additional cargo between the locations
→ Likely to justify ~80 port-hub shuttles per week (40 IMP, 40 EXP).
→ Here: ~20 port-shuttles per sea-port per week (~2 trains in and out 5-days-a week)

 # connections: 66

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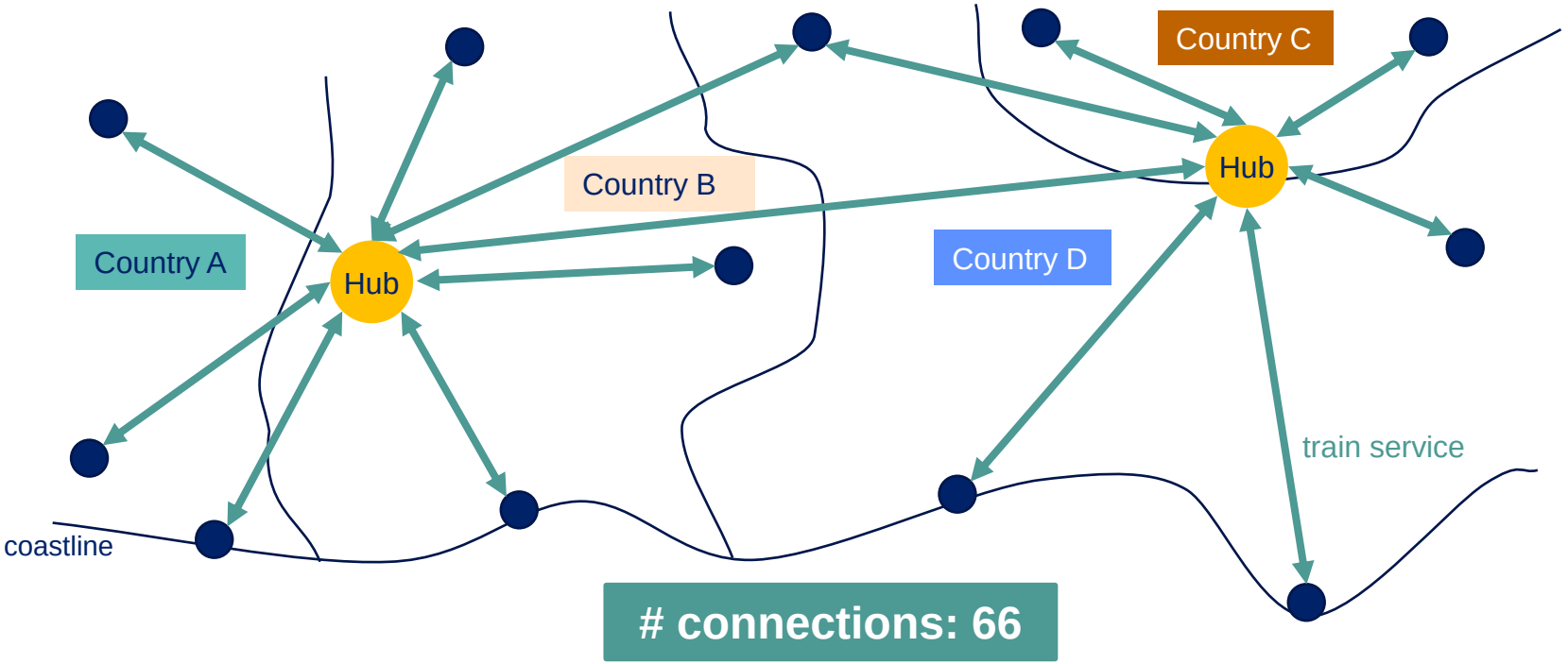
What are the challenges?

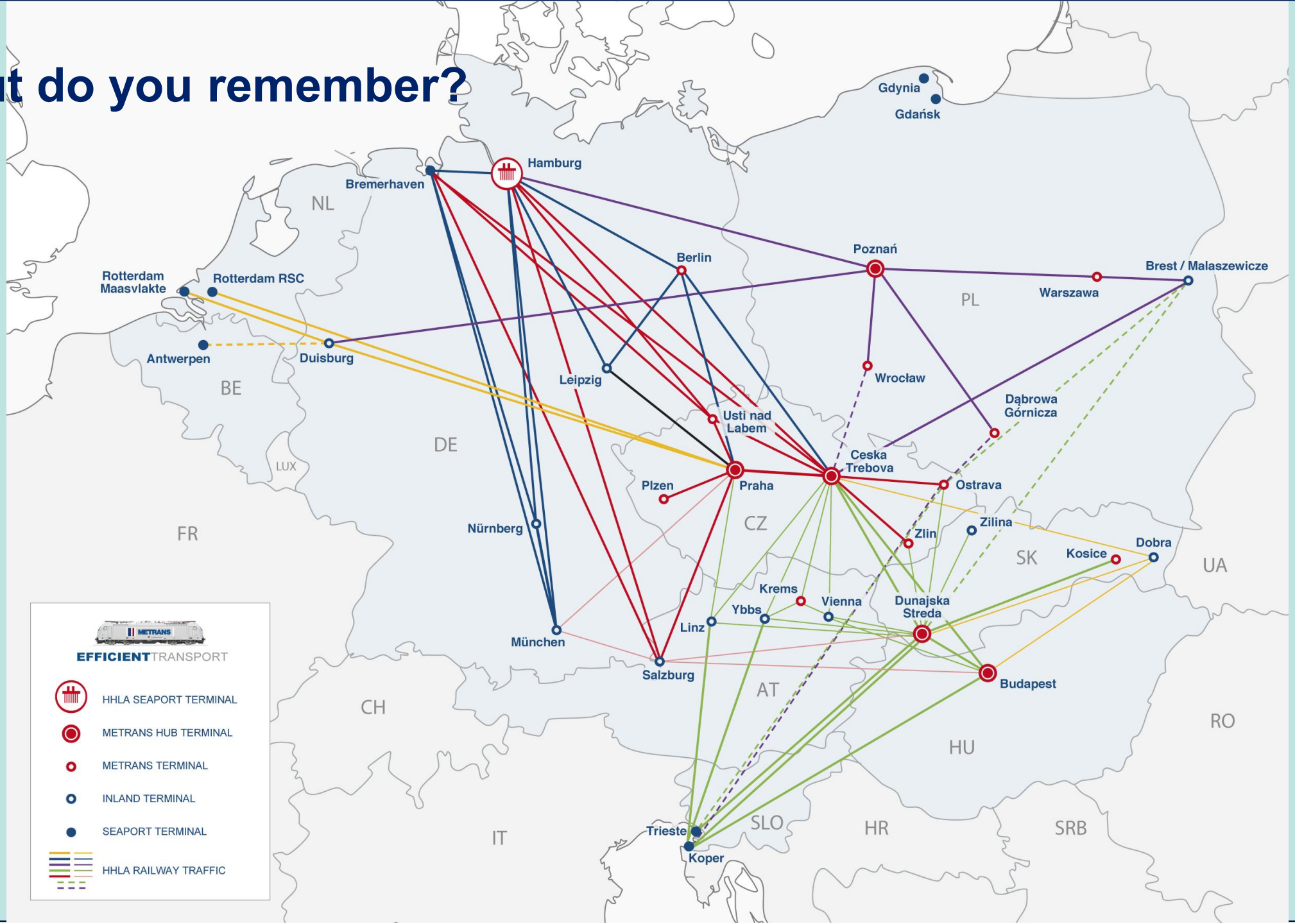


Challenges:

- Rail infrastructure is typically considered an “infrastructure of national interest” for all involved countries.
- Competition arising from the increased number of options might be seen as a threat.
- Cultural and language differences might present difficulties in the planning, implementation and management.

→ **To Europeans, all of this sounds very familiar…**

…but do you remember?



How can it be developed successfully?

- **Requirements:**
  - Physical infrastructure needs to be substantially improved, e.g.
    - Rail tracks, and
    - Adequate intermodal terminals.
  - An efficient rail network in West Africa needs to be planned in a cooperative way, set up and organized **beyond national borders**.
  - Administrative & IT infrastructure needs to be set up accordingly, e.g. customs topics etc.

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- **Approach:**
  - A **common initiative** is required, overcoming challenges with respect to language, culture, individual interest, etc.
  - Strong and **sustainable political backing:** support from governments and transnational institutions required.
  - Individual countries as main stakeholders need to **acknowledge** that they can only **build the future of the region together**.

What are the stages to get there?

- **Plan:**
  - Elaborate **“Intermodal Master Plan West Africa”**, bringing together the relevant stakeholders, willing to start this common endeavour.
  - This comprehensive plan needs to be pursued in a phased approach.
  - Identify pilot projects, expected to create most value for the money.
  - Agree on roadmap and prioritization of next steps.
- **Develop:**
  - Proceed to the actual development of related rail infrastructure:
    - Intermodal terminals (local and hub)
    - Shunting yards and track network
  - Elaborate a transborder regulatory framework.
  - Define and create IT requirements and system architecture.
- **Implement:**
  - Assure coordinated implementation of infrastructural and other measures
- **Manage:**
  - Establish a management approach for the system
  - Maintain the relationships between all stakeholders.
  - Emphasize the importance of maintaining the assets.

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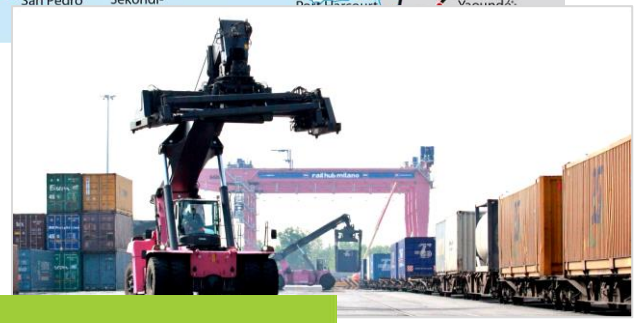
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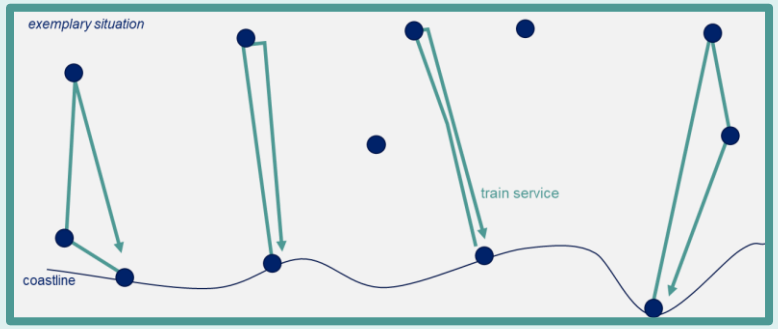
What's at stake for West Africa?



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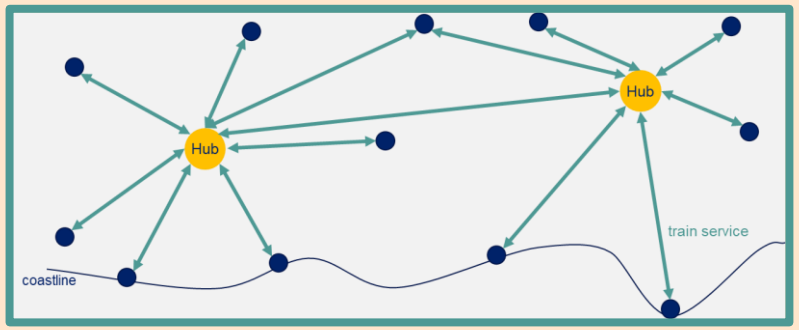
Export the natural resources; value created elsewhere…

or



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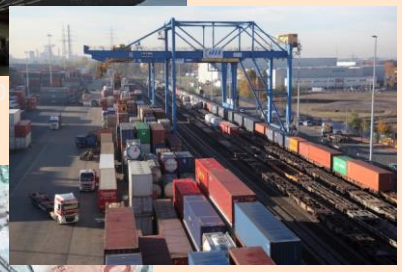

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Develop, produce and provide high quality products and services in an efficient supply chain and grow as a region!

Thank you!
How can we assist?

Christoph Schoppmann

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