FinEst Bay Area Development
The Helsinki-Tallinn Tunnel Project
3.12.2018 FinEstBayArea Development Group
EXCELLENT GLOBAL LOCATION
AT THE HEART OF EURASIA

- Finland is the closest neighbor of China, India and Japan in the EU
- Direct 6-8 hours connections to several cities in China, India, Japan and rest of Asia
Finest Bay Area Global Attraction
FINLAND

Best Education
Happiest Nation
Cleanest Air
Least Corruption
The Island

103km tunnel

Helsinki-Vantaa Airport

Tallinn

Four Stations
20 min end to end

Aalto OtaKeila
THE HELSINKI TALLINN METRO AREA
2 MILLION+ PEOPLE AT THE HEART OF EURASIA

The Helsinki-Tallinn Tunnel
- Creating center of gravity
- Enabling future growth
- Affordable housing at scale
- University Platform
Sweden's capital is swelling more rapidly than any other city in Europe, with its population expected to expand by 11 percent from 2015 to 2020.

Europe’s fastest growing cities:

- Stockholm: 11%
- Copenhagen: 10.3%
- Helsinki: 5.7%
Helsinki is the busiest passenger harbor in the world. Surpassed Dover in 2017
Growth fueled by Helsinki-Tallinn traffic
Helsinki-Tallinn 2 hours by ferry
Passenger traffic volumes

Current

Espoo

125 M

Helsinki

10 M

Tallinn

3 M

Helsinki Airport

20 M

Assumptions 2030

Espoo

200 M

Helsinki-Tallinn Airport

50 M

Tallinn

70 M

Helsinki

20 M

3 M
The Tunnel Project

Finest Bay Area Helsinki
Mechanised tunneling by TBM

TBM = Tunnel Boring Machine
Tunnel Project Timelines

- Project design, permits and planning 2017-2019
- Construction start 2019-2020
- Tunnel operational 24.12.2024
Tunnel construction detailed timeline:

<table>
<thead>
<tr>
<th>Station</th>
<th>Shaft or station</th>
<th>Station</th>
<th>Station</th>
<th>Station</th>
<th>Depot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tallinn</td>
<td></td>
<td>Tallinnmadal</td>
<td>Ulkomatala</td>
<td>Otakeila</td>
<td>Lentoasema</td>
</tr>
<tr>
<td>35 km</td>
<td>33 km</td>
<td>21 km</td>
<td>18 km</td>
<td>9 km</td>
<td>360</td>
</tr>
<tr>
<td>17.5 km from both directions</td>
<td>16.5 km from both directions</td>
<td>10.5 km from both directions</td>
<td>9 km from both directions</td>
<td>9 km from depot</td>
<td></td>
</tr>
<tr>
<td>TBM</td>
<td>TBM</td>
<td>TBM</td>
<td>TBM</td>
<td>D/B</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>5.8</td>
<td>5.5</td>
<td>3.5</td>
<td>3</td>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td>5.8 km/a</td>
<td>5.5 km/a</td>
<td>3.5 km/a</td>
<td>3 km/a</td>
<td>2.2 km/a</td>
<td></td>
</tr>
<tr>
<td>17.5 m/day (330 workingdays/a)</td>
<td>16.6 m/day (330 workingdays/a)</td>
<td>10.6 m/day (330 workingdays/a)</td>
<td>9.1 m/day (330 workingdays/a)</td>
<td>6.7 m/day (330 workingdays/a)</td>
<td></td>
</tr>
<tr>
<td>700 days</td>
<td>660 days</td>
<td>420 days</td>
<td>360 days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1 a</td>
<td>2.0 a</td>
<td>1.3 a</td>
<td>1.1 a</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Permissions > TBM order
Building of drop caisson and gallery excavations
TBM installation
Tunnel excavation
Technical installations
Testing and acceptance period
Building of track yard and connecting line
D/B tunnel excavation

Q4/2019
Q1/2020
Q2/2020
Q3/2020
Q4/2020
Q1/2021
Q2/2021
Q3/2021
Q1/2022
Q2/2022
Q3/2022
Q4/2022
Q1/2023
Q2/2023
Q3/2023
Q4/2023
Q1/2024
Q2/2024
Q3/2024
Q4/2024
Environmental Impact Assessment
Permits, Approvals and Licenses
ACCELERATED AND PARALLEL PROCESSING FOR PERMITS AND LICENSES IS NEEDED

Preliminary list for required permits and licenses

- General plan, preliminary overview of the project plan
- Comprehensive Environmental Impact Assessment EIA
- Espoo Convention on EIA general agreement, transboundary context
- Maritime spatial planning + FIN/EST national legislation. Stipulated by the EU Maritime Strategy Directive → FIN, EST national strategies
- The evaluation of Natura 2000 -protected maritime areas + Baltic Special Protected Areas, BSPAs. Many BSPAs are protected under national or international legal regimes
- Regional land use plans covering general planning over to national sea frontier lines. Artificial islands permitted by the respective countries / regions
- Zoning plan + City plans (land use) for under-ground tunnels, railways, traffic networks, stations
- Activities on Exclusive Economic Zone EEZ (outside the Seafrontier areas) need an approval from the state).
- Law on water resources, applicable also within sea frontiers and Economic Zone → Permits for water resource utilization
- Tunnel construction regulations (EU-level, national level). Railway tunnel regulations and EU Directives
- Law on railroad construction → Plans → Permission to construct a railroad
- Safety & rescue requirements stipulated by the laws and requirement
- Construction permits inland
- Construction permits off-shore (artificial island)
- Permits for boring under the seabed
- Impacts on fishery (part of EIA) covering the Baltic area
FINEST ENVIRONMENTAL IMPACT ASSESSMENT
EIA PROGRAMME
NATURE SURVEYS
December 3, 2018
Karoliina Jaatinen, Project manager, EIA process, Pöyry
Mikko Inkala, BU President, Infra Design, Pöyry
Timo Saanio, Vice President, A-Insinöörit, AINS Group
The deepest vertical point of alignment at the depth of -250m from the sea level.
FINEST BAY AREA PROJECT
PRELIMINARY TUNNEL CROSS SECTION AND CONCEPT

- Two railway tunnels
- Exit cross tunnels
- Diameter up to 17,5 m
- Total excavated amount of rock more than 80 million m³

Original source: www.herrenknecht.com
Four lines to be studied during the EIA procedure
- red VE1a and green VE1b
- VE2 reference line from the Finest Link feasibility Study

3 different comparable alternatives in the EIA procedure and a "0+-alternative"

Cargo terminal

Stations:
- Helsinki-Vantaa Airport
- Ilmala / Finnopolis
- Otakeila
- ”The Island”
- Tallinn Ülemiste Airport

Access tunnels
Artificial island
Shafts
In Estonia:
- VE1a: maintenance island on Uusmadal
- VE1b: maintenance island on Tallinnamadal
- VE1c: maintenance island on Nygrundi madal
- VE2: maintenance island on Tallinnamadal
- VE0+: not to implement the project but considering some future scenarios

Artificial island

Stations:
- Tallinn Airport in Ülemiste
PROJECT DEVELOPER, AUTHORITY AND EIA CONSULTANT

Project developer:
Finest Bay Area Development Oy/ Kustaa Valtonen & Peter Vesterbacka

Liaison authority in Finland is the Centre for Economic Development, Transport and the Environment in Uusimaa; Leena Eerola

EIA consultant:
Pöyry Finland Oy
Project manager: Karoliina Jaatinen
Project coordinator in Estonia: Entec Eesti OÜ, Andres Piirsalu

Technical design, consortium
Pöyry Finland Oy
A-Insinöörit Oy
Fira Oy
EIA & technical designing: 40 experts in Finland and Estonia
FINEST BAY AREA PROJECT
GENERAL PRINCIPLES OF ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

- To examine the project’s environmental impacts for the entire planned tunnel route alternatives and related activities. Both construction and operation phases have to be examined.

- **Two phases in the EIA Process:** 1) EIA Program 2) EIA Report

- The EIA procedure has to be conducted both in Finland and Estonia in compliance with the national legislation.

- International hearing has to be arranged due to the international dimension of the project and possible transboundary effects.

- The coordinating authorities are
  - The Uusimaa Centre for Economic Development, Transport and the Environment
  - Finnish Ministry of the Environment
  - Estonian Ministry of Economic Affairs and Communications.
## STATUS OF THE EIA

<table>
<thead>
<tr>
<th>EIA programme phase in Finland</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submission of EIA programme</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EIA initiation, Espoo Convention notification</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EIA Programme on public display (60 days)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coordinating authority’s statement</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EIA programme phase in Estonia</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submission of “Hoonesustuslabe” application</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Request for comments and publication</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision to launch superficies license process and EIA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EIA initiation Espoo Convention notification</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EIA programme compilation and and submission</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EIA programme on public display and meeting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coordinating authority’s statement</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EIA report phase in Finland</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preconceived investigations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact assessment and EIA report</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EIA report on public display (60 days)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Espoo Convention hearing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coordinating authority’s statement</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Permitting phase in Finland</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research permit applications and the preconceived investigations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparation of the permit application</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permit application processing time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permit decision</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EIA report and permitting phase in Estonia</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preconceived investigations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact assessment and EIA report</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EIA report on public display (60 days)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coordinating authority’s statement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permit decision</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
EIA REPORT
DIFFERENT IMPACT CATEGORIES INVESTIGATED

- Seabed
- Soil, bedrock and groundwater
- Hydrology and water quality
- Marine environment
- Fish & fisheries
- Noise
- Vibration
- Traffic and traffic safety
- Air emissions

- Flora, fauna and protected sites
- Land use and built environment
- Landscape and cultural environment
- People and society
- Waste and waste handling
- Exceptional accident situations
- Transboundary impacts
EIA REPORT

- New separate studies are also needed for the EIA report. These include:
  - Underwater archeological surveys
  - Underwater nature inventory by diving
  - Sea bed sediment quality survey
  - Birdlife studies
  - Fisheries studies
  - Unexploded ordnances (UXO’s) study
  - Water quality and flow modelling

Pictures: Jouni Leinikki, Karoliina Jaatinen
Consortium partners
Project Funding
Phased Funding

1. Project preparation
2. Planning and design
3. Construction
4. Funding 1
5. Funding 2
6. Funding 3
7. Test and operate

Funding timeline:
- 16: Project preparation
- 17: Planning and design
- 18: Construction
- 19: Funding 1
- 20: Funding 2
- 21: Funding 3
- 22: Test and operate
- 23: 24: 25:

Clock.

Dates:
- 16
- 17
- 18
- 19
- 20
- 21
- 22
- 23
- 24
- 25
Financials

- Tunnel project estimate total cost 15B€
- Design 750M€
- Construction 12,5B€
- Project management 1B€
- Management 750M€
Financial model based on World Bank methodology

- Project finance methodology is based on Rail Reform Toolkit provided by World Bank and PPIAF (2017)
- Additional calculations and application is provided by the Finest Bay Area Development Company
- Benchmark operators are
  - Getlink (Channel Tunnel)
  - Tallink (Baltic sea ferry operator)
  - VR (State Railway in Finland)
Assumptions for financial calculations

- Total tunnel investment 15 017 M€
- Discount Interest rate 6%
- Inflation rate 2%
- Tunnel investment timespan 30 years
- Tunnel life-cycle is 120 years, major service interval 40 years
- Residual value after 30 year is assumed to be 60% of nominal investment, 9 160 M€
- Passenger traffic and freight included in investment calculations
  - 51 M annual trips (2016: 9M)
  - € 50 single (41% of passengers)
  - € 100 return (42% of passengers)
  - € 2 499 annual pass (17% of passengers)
  - 22 M tonnes freight (2016: total 8,4M)

*ROI= net income / investment*
Fare and tariff assumptions

Facts: pricing 11/2018*
• Finnish train 2018
  • Helsinki – Oulu 56€
  • Helsinki – Tampere 18€
  • Helsinki – Lahti 13€
• Finland - Estonia ferries 2018
  • Tallink, return 50€ (2,5h)
  • Eckerö line, return 24€ (2h 15min)
• Finland – Estonia flight 2018
  • 165 € (30min)

Helsinki - Tallinn pricing assumptions 2024*
• Inflation assumption 2% p.a. will result 13% price increase in all prices
• Reference prices
  • Tallink return 56,5€
  • Finnair flight 186,5
• Tunnel train will be 10 min faster than flight
• Pricing arbitrarily assumed between flight and ferry ticket prices: 100€ return ticket

*single adult
Group cash flow breakdown*

*Debt payments not included
** Interest rate assumption 5% + 2% margin
Cumulative cash flow

Payback period
17 years

IRR 10.11%
Impact on Finnish GDP is significant.
Industry investments in Finland will almost double in 2022-2024
Impact on Estonian GDP is even larger.
Tunnel has positive impact on GDP growth

### Case 2021: increase in GDP growth (% point)

<table>
<thead>
<tr>
<th></th>
<th>FIN</th>
<th>EST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct</td>
<td>+0,6%</td>
<td>+0,6%</td>
</tr>
<tr>
<td>Indirect</td>
<td>+1,2%</td>
<td>+1,6%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GDP growth forecast scenarios FIN and EST</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP FIN (%)</td>
<td>3,0 %</td>
<td>2,3 %</td>
<td>1,7 %</td>
<td>1,7 %</td>
<td>1,7 %</td>
<td>1,7 %</td>
<td>1,7 %</td>
<td>1,7 %</td>
</tr>
<tr>
<td>GDP FIN incl. 90%FBADC (1x, %)</td>
<td>3,0 %</td>
<td>2,3 %</td>
<td>2,0 %</td>
<td>2,3 %</td>
<td>2,0 %</td>
<td>1,7 %</td>
<td>1,6 %</td>
<td>0,8 %</td>
</tr>
<tr>
<td>GDP FIN incl. 90% FBADC, indirect (2x, %)</td>
<td>3,0 %</td>
<td>2,4 %</td>
<td>2,4 %</td>
<td>2,9 %</td>
<td>2,4 %</td>
<td>1,7 %</td>
<td>1,5 %</td>
<td>-0,1 %</td>
</tr>
<tr>
<td>GDP FIN incl. 90% FBADC, indirect, real-estate (10x, %), 3y lag</td>
<td>1,7 %</td>
<td>2,1 %</td>
<td>4,8 %</td>
<td>7,2 %</td>
<td>4,8 %</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| GDP EST (%)                              | 3,5 % | 2,7 % | 2,7 % | 2,7 % | 2,7 % | 2,7 % | 2,7 % | 2,7 % |
| GDP EST incl. 10% FBADC (1x, %)          | 3,5 % | 2,7 % | 3,1 % | 3,3 % | 3,1 % | 2,7 % | 2,6 % | 1,8 % |
| GDP EST incl. 10% FBADC, indirect (2x, %)| 3,5 % | 2,8 % | 3,4 % | 3,9 % | 3,4 % | 2,7 % | 2,4 % | 0,8 % |
| GDP EST incl. 10% FBADC, indirect, real-estate (10x, %), 3y lag | 2,7 % | 3,1 % | 6,0 % | 8,3 % | 5,8 % |      |      |      |
Ticketing and Innovation Platform

Tickets available:

https://shop.finestbayarea.online/

<table>
<thead>
<tr>
<th>Ticket Type</th>
<th>Price</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Ticket</td>
<td>€50,00</td>
<td>One-way ticket voucher, Travel anytime, any day</td>
</tr>
<tr>
<td>Return Ticket</td>
<td>€100,00</td>
<td>Return ticket voucher, Travel anytime, any day</td>
</tr>
<tr>
<td>1 Year Unlimited</td>
<td>€1,000,00</td>
<td>Annual subscription voucher, As many trips as you need</td>
</tr>
</tbody>
</table>
Funding is raised in annual batches every Q1

30% equity and 70% loan

Balanced source of investment, 50/50 Asia-Europe
First funding round done

• Equity funding of 100M€
• ARJ Holding Ltd. Dubai
How to follow the project?

Facebook: ”FinestBayArea Tunnel Project”

YouTube: FinestBayArea Channel & with Finestbayarea search word videos

Website: www.finestbayarea.online
Thank You!

Contact: Kustaa Valtonen
Kustaa@live.com

FINEST BAY AREA DEVELOPMENT