Mesta: Building the avenue to a greater Construction West

Presented by
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Executive Summary

Objective

How can Mesta develop a project plan to better manage its cost, especially the labor and material costs, to improve the project margins in Construction West?

Analysis

Core issue:
Cost management

Key cost items:
Labour and material costs

Labour inefficiency and raising **material** costs for bridges

Strategy

Labour costs

New prediction model to create an adequate material register account

Material costs

Introduce Mestable to analyze the performance contract and reallocating work to employees

Impact

13%
Profit Margin
in 2024

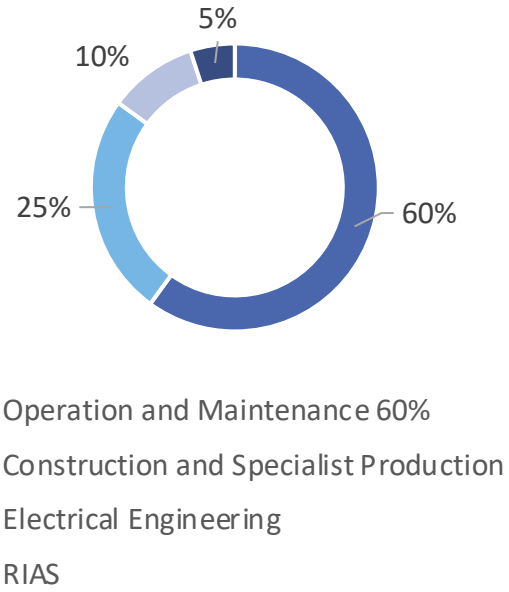
NOK 35.6 million
Total saved cost
By 2027

Analysis

An explanation of the current construction industry and Mesta's internal business

Despite good revenue growth, construction&specialist production faces limited profitability

Mesta's revenue by business area



Construction and specialist production

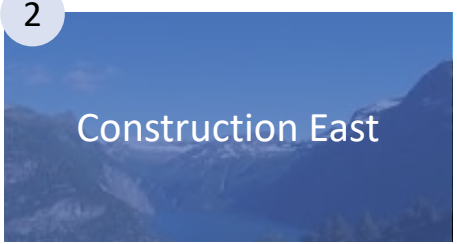
Projects and construction work involving roads, tunnels, railways

- Good revenue growth
- More public customers

Reduced profitability led by onerous contracts

1

2



The core issue is identified by comparing the performances of the East and the West

	Revenues (million NOK)	Active Project volumes	Results (million NOK)
 West Region	2022: 222.3	Active projects #: 53 Active projects%: 48%	2022: -3.6
 East Region	2022: 259.5	Active projects#: 44 Active projects:38%	2022: 35.3
Implication	Similar	Similar	West < East
	Not the core issue		Cost is the core issue

Construction East needs better cost management on individual projects to improve profitability

Focused cost items are selected with three criteria

Cost Items	Increasing expenses?	Significant impact?	Difference between West and East ?
Labor	Medium	High	High
Material	High	High	High
Equipment	Low	Medium	Medium
Administration	Low	Low	Low

Labor inefficiency is observed in Construction West, leading to higher cost

Increasing numbers of labor and cost…

Industry

Raising labor cost:

Norway Construction Labor Index

6.5% increase from 2020 Q3

Mesta

More employees in the West:

	East	West
Specialized employees	24	24
Common Workers	34	55

… may come with inefficiency problems in the West

Given the harsher weather conditions in Western Norway, inefficiency occurs when:

- Long idle time when there is lacking materials
- Delayed communication when there are changing orders

Construction West needs a more efficient and flexible system to analyze labor cost allocation

A upgraded system is needed to lower the labor cost in Construction West

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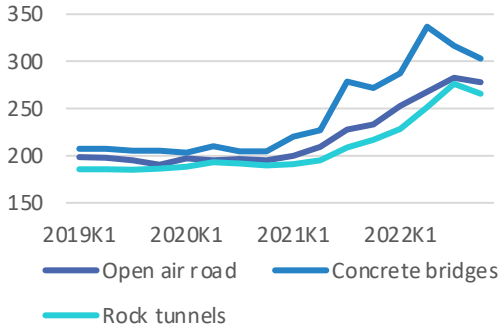
Mesta should focus on managing material cost, especially for bridge projects

Bridge construction should be the focus area

Construction Cost Index (Material Cost)



Most rapid material cost increase: **bridge**

In the West:
Usually made with more expensive concrete

In the East:
Usually made with less expensive steel

Rise of design-build model

Strong growth in **design-build** contracts in the Norwegian market :

Statens vegvesen
Norwegian Public Roads Administration

Aim: increase the use to **40%**

Nye Veier

Using in nearly **all projects**

Mesta would be able to engage more decisions regarding materials

Mesta could optimize material cost management by engaging more in material selection and procurement

Source: Statistics Norway

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Construction Cost Index (Material Cost)

Most rapid

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Usually made with more expensive concrete

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Rise of design-build model

Strong growth in **design-build** contracts in the Norwegian market :

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Mesta would be able to engage more decisions regarding materials

A project plan is needed for Mesta to better manage its cost, especially the labor and material costs,to improve the project margins in Construction West

Mesta could optimize material cost management by engaging more in material selection and procurement

Source: Statistics Norway

Strategy

Review two main structure and operations of Mesta – Material and Labor

A 2-step roadmap to develop a mega loyalty programme in Hong Kong

Laying the groundwork

Paving the avenue

MESTA'S COST MANAGEMENT

1 Labor cost

- Mestable system
- Input key information
- Raise working efficiency

2 Material cost

- Updated system
- three-step prediction model
- Adopt in other regions scheme

Mesta risks placing expensive orders of materials separately in its current inventory system

Current situation of Mesta

Little inventories of various materials on its balance sheet

Lack of understanding of optimum inventory level of different materials

Only place orders from suppliers when needed in particular projects

Problem 1

May risk ordering the materials when the prices are unfavorably high

Problem 2

May risk ordering same material in separate orders in different quantities

Mesta should know ***WHEN*** and ***HOW MUCH*** to procure its materials in order to cut costs and improve margins

A new prediction model could help to create an adequate material register account

Aim

Understands the current situation and levels of the concrete Mesta has ***KEPT*** and ***RESERVED*** for anticipated projects

Prediction Model

Collect	Predict	Alert
 Historical prices of materials *E.g. Construction Index of Materials in Norway*	 Feed into a model to track the patterns of changes	 Be automatically sent when prices are favourably low,
 Usage of concrete in past projects of bridges in the West	 Predict the levels or directions of the prices of materials	 Procurement division would receive the alert

Action: initiate a contract with suppliers to order a particular amount of concrete

After procuring materials, they would be used in projects in which Mesta involves in designing stage

For materials already procured **with favorable prices…**

Design – Build Model

Mesta could involve in the designing stage

Mesta would then build the projects

Partners with other designing houses

Understands design of construction projects earlier through CAD drawings

Offer suggestions on materials choice according to its material register

For materials required in designs but **without favorable prices…**

Collect data of usage of materials in other past projects of bridges in the West

Track record 

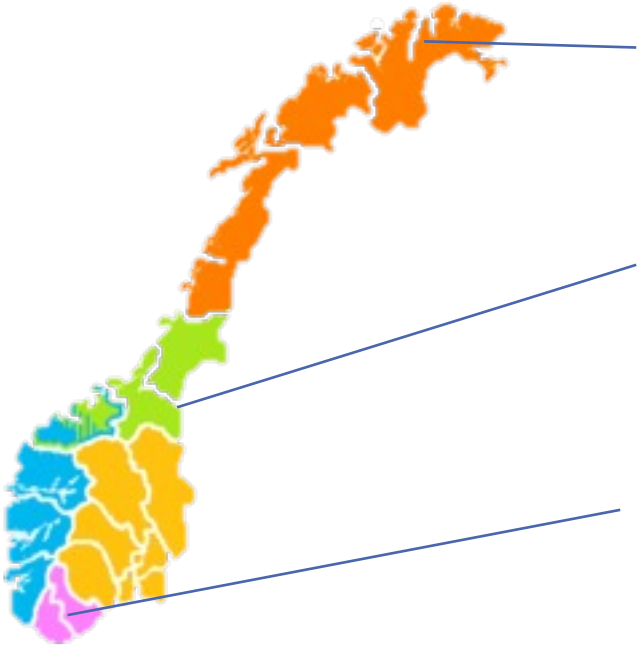
Negotiate with suppliers for a more favorable price

Track record 

Purchase the required amount of concrete for the project

The same system could be adopted to cater for unique needs of different regions in Norway

Key Question: How to adopt this system in other sub-areas or regions?



Northern Norway

Numerous coastal ports projects for cargo and cruise destinations

Understand usage of rubber / iron

Eastern Norway

Numerous suspension bridge projects

Understand usage of steel / iron clad

Southern Norway

Numerous railways projects along idyllic towns

Understand usage of steel / asphalt

Mesta should adopt the system to know the optimum **amount** of & **timing** to procure materials in other regions

MestaBLE is a more advanced working system for a better allocation of Mesta workers

mestaBLE (**BLE** - **B**reakthrough, **L**imitless, **E**fficient)

Analyzing the performance of the contract and reallocating work to the specialized employees and common workers who are idling from work.

Goals: raise working efficiency to reduce cost through digital innovation on allocation of workers

Resources used for MestaBLE

1. Mesta platform in the Microsoft Azure cloud
2. Machine learning and data analytics
3. Optimization algorithms

MestaBLE will be obtaining the following information…

Measuring the performance of the contracts
Eg, Onerous contracts of unskilled workers
-> unavoidable cost is greater than the economic benefits

Analyzing factors affecting the amount of idling time
Eg, Natural hazard, delay of raw materials, approval of permits
-> Increase in Idling time

Evaluating the status of workers in different projects
Eg, Status: Shortage / Idle / Surplus
-> decrease in working efficiency

Obtaining the information obtain by MestaBLE enhance the reallocation of the worker

Information obtained by MestaBLE

- Measuring the performance of the contracts
- Analyzing factors affecting the amount of idling time
- Evaluating the status of workers in different projects

Reallocation of work

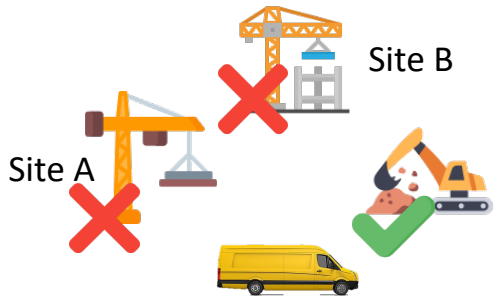
Following actions brought by MestaBLE

1. Identify the workers who are idling from work with onerous contracts
2. Reallocate the workers in different sites to work
3. Calculate the amount that reduces in the idling time

In the region west of Mesta's construction sites

Site A worker — Taking sick leave

Site B worker — Idling from work due to natural hazards



Site A and B are not working due to the natural hazards and absence of workers

Lowering in working efficiency

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mesta BLE

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Site A — Site B — Site C

Site A and B are not working due to the natural hazards and absence of workers

Lowering in working efficiency

However, with the MestaBLE, this condition could be improved….

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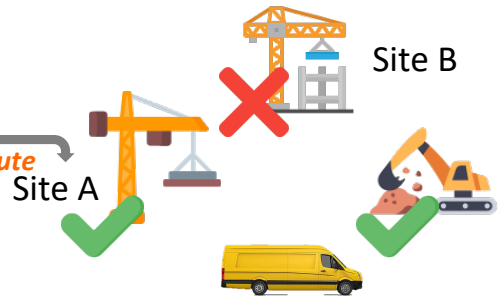
Site A worker — Taking sick leave

Site B worker — Idling from work due to natural hazards

Reallocate to site A to substitute



Site A could have substitute worker to avoid slowing down the progress of work

Increase in working efficiency and reduce the cost

Reviewing the working journey of the Mesta worker to improve their working efficiency

Felix
(unskilled worker)

Values:

- Compensations and welfares
- Personal safety
- Clear instructions

With a routine work schedule, (during natural hazards)

1. Work in a fixed location

2. Suspend from working

3. Idling in project

VS

With the MestaBLE system, (during natural hazards)

1. Check the assigned sites

2. Work in the sites

3. Record the progress

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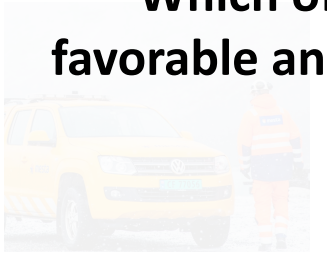
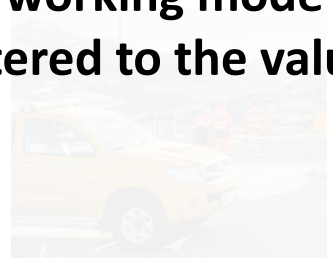
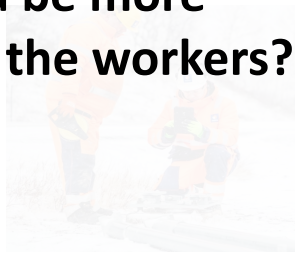


1. Check the assigned sites



2. Work in the sites



3. Record the progress

Which of the working mode would be more favorable and catered to the values of the workers?

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- Personal safety
- Clear instructions

With a routine work schedule, (during natural hazards)

1. Work in a fixed location
2. Suspend from working
3. Idling in project

1. More prone to work under natural hazards
2. Unclear instructions when there is suspension of work and slowing down the progress

VS

With the MestaBLE system, (during natural hazards)

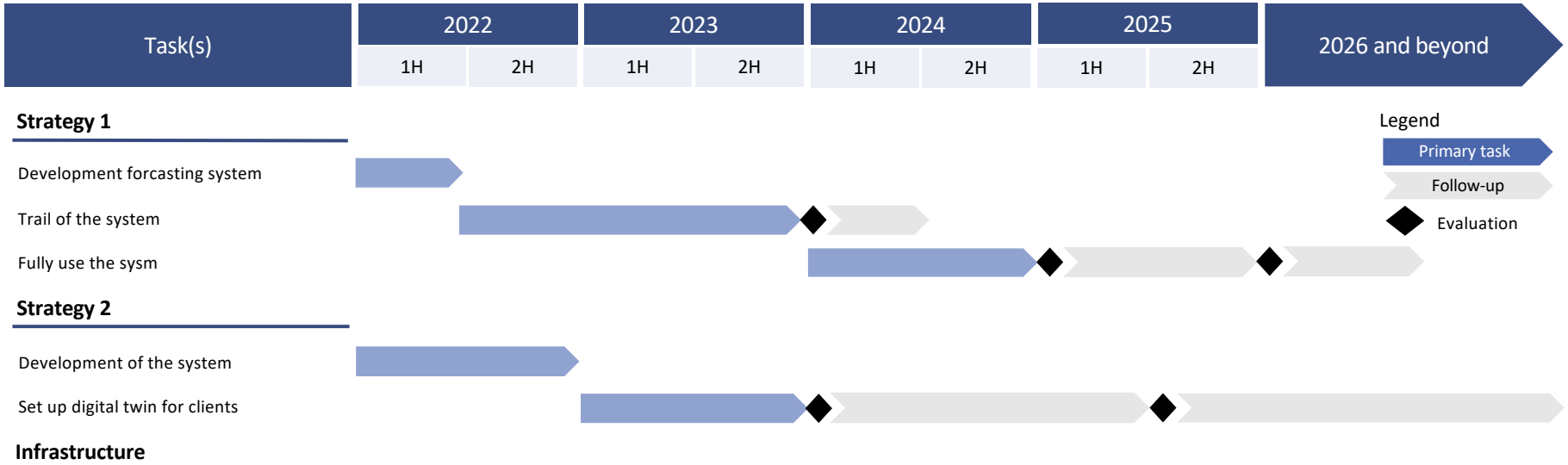
1. Check the assigned sites
2. Work in the sites
3. Record the progress

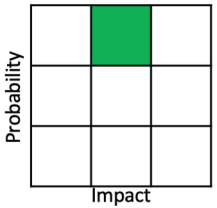
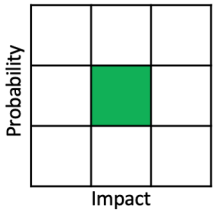
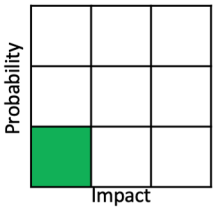
1. Better safety to avoid workers working under natural hazards
2. Clearer instructions with assigned duties and previous record

Financials and implementation

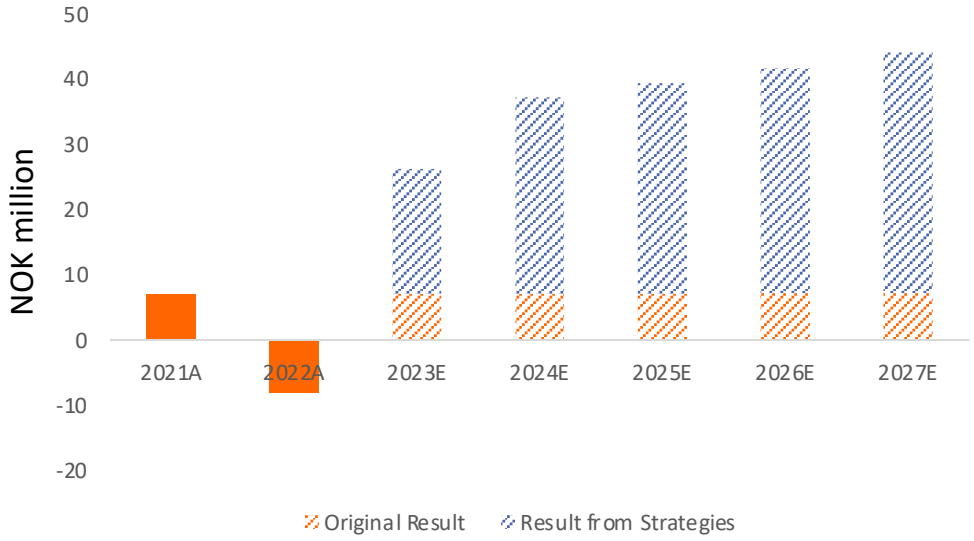
The practical approaches that Mesta should take to put the strategies in place

Our strategies would rollout in x phases/ there are must-win battles in 20xx



1	Failure to forecast the prices of materials		1 • Recruit economists and financial experts to
2	Political dispute between two parties and the supporters		2 • The transfer of administration has made the issue of climate change the main direction of national policy, and greatly reduced policy risks • It is still necessary to pay attention to the bipartisan interests and focus on influencing the decision maker
3	Sufficient and sustainable finances to continue operations		3 • The cost of our strategy is low - except for the personnel and platform fees, the rest is voluntary participation by the medical advocates • Public voice and great performance will attract funding sources, creating a virtuous cycle of impact

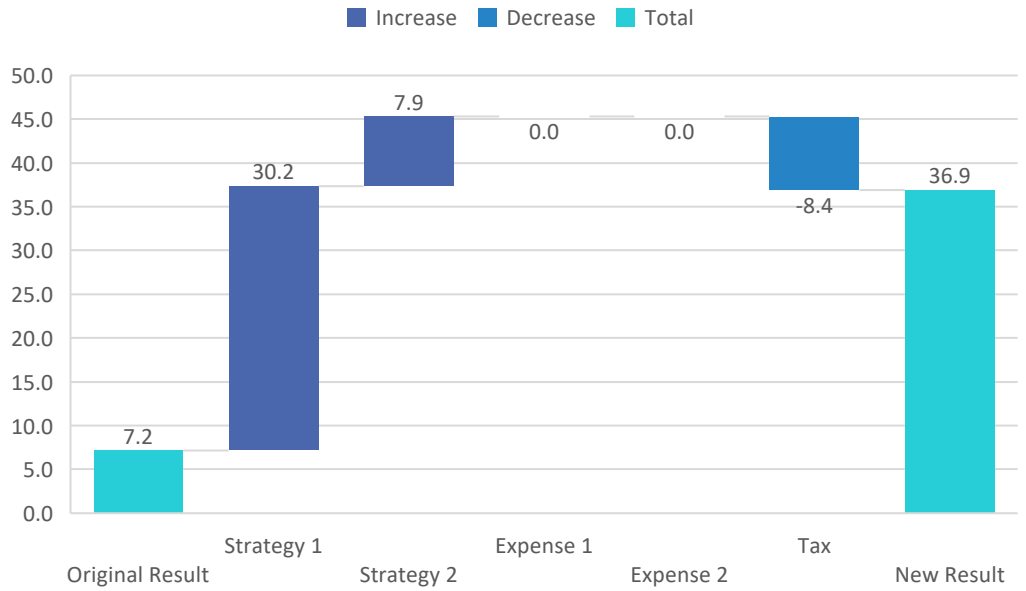
Estimated Project Profit in 5 years



Key Metrics

Profit Margin in 2024	**13%**
Total Saved Cost By 2027	**NOK 35.6** million

Breakdown of New Profit in 2027



Key Assumption For Impact

10% of the projects are affected by extreme weather

Average 2 months will be delayed for each projects

20% of materials cost could be saved

Assumption / Key Stats	Unit	
Norway GDP Growth	%	1.30%
Norway Construction Industry CAGR	%	4%
Total Projects in Western	#	53
2021Q1 Concrete Price / Cubic Yard	$ per cubic yard	104
2022Q1 Concrete Price / Cubic Yard	$ per cubic yard	131.07
USD to NOK	NOK	10.38
Asphalt Paving Mixture Cycle	Months	12
Concrete Price Cycle	Months	36
m^2 to Cubic Yard	Cubic Yard	1.31
Average Bridge Project Size	m2	1259.6
Concrete Market CAGR	%	5.10%
Revenue of Construction in Western Norway	NOK Million	222.3
2022Q1 Asphalt Price	$ per m^2	139.9
Asphalt Price change from 2021Q1 to 2022Q2	%	27%
2021Q1 Asphalt Price	$ per m^2	109.97
Asphalt Market CAGR	%	5.30%
Average Road Project Size	m^2	1000
Project extended duration		20%

NOK millions

Year	Unit	2023E	2024E	2025E	2026E	2027E
Strategy 1: New Procurement System						
Bridge Proejcts in Western Norway						
% of bridges projects in western projects	%	20%				
Bridge Proejcts in Western Norway	#	5	11	11	11	12
% of growth	%		*112%*	*4%*	*4%*	*4%*
Original Concrete Cost	NOK per cubic yard	1,361	1430	1503	1579	1660
% of growth	%	*5%*	*5%*	*5%*	*5%*	*5%*
New Concrete Cost	NOK per cubic yard	1,080	1135	1192	1253	1317
% of growth	%	*5%*	*5%*	*5%*	*5%*	*5%*
Amount of Materials Required per project	Cubic Yard	1,650	1,650	1,650	1,650	1,650
Saved Cost	NOK millions	2.32	5.17	5.65	6.17	6.75
Road Proejcts in Western Norway						
% of road projects in western projects	%	60%				
Road Proejcts in Western Norway	#	15.9	31.8	33	34	36
% of growth	%	*4%*	*4%*	*4%*	*4%*	*4%*
Original Asphalt Cost	NOK per cubic yard	1,902	2,003	2,109	2,221	2,339
% of growth	%	*5%*	*5%*	*5%*	*5%*	*5%*
New Asphalt Cost	NOK per cubic yard	1,495	1,575	1,658	1,746	1,838
% of growth	%	*5%*	*5%*	*5%*	*5%*	*5%*
Amount of Materials Required per project	Cubic Yard	1310	1310	1310	1310	1310
Saved Cost	NOK millions	8.48	17.85	19.55	21.41	23.45
Total Saved Cost of Strategy 1		**10.79**	**23.02**	**25.20**	**27.58**	**30.19**
Strategy 2: Labour efficiencies						
% of projects affected by extreme weather	%	10%				
Proejects affected by extreme weather	#	5	6	6	6	6
% growth	%	*4%*	*4%*	*4%*	*4%*	*4%*
Average project duration	Month	10				
Extra time required to complete a project	Month	2	2	2	2	2
Total Monthly Salary for a project	NOK	587,217	600,136	613,339	626,832	640,623
% growth	%	2.2%	2.2%	2.2%	2.2%	2.2%
Saved Salary	NOK Million	6	7	7	7	8
Total Saved Cost of Strategy 2	**NOK Million**	**6**	**7**	**7**	**7**	**8**
Total Saved Cost	**NOK Million**	**17.02**	**29.63**	**32.23**	**35.05**	**38.14**

Expense

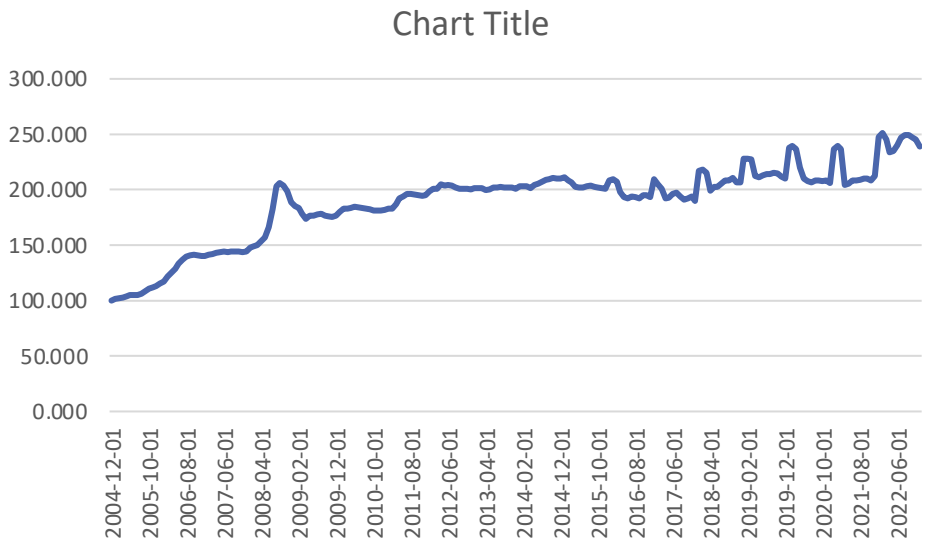
Year	Unit	2023E	2024E	2025E	2026E	2027E
Strategy 1						
Storage Cost	NOK per square meter pe	41.52	42.05976	42.60653688	43.16042186	43.72150734
% growth		1%	1%	1%	1%	1%
New required materials	Square Meter	2,960	2	2.026	2.052338	2.079018394
% growth		1%	1%	1%	1%	1%
Expense		**1.47**	**0.00**	**0.00**	**0.00**	**0.00**
Strategy 2						
App Maintenance		0.0087192	0.0087192	0.0087192	0.0087192	0.0087192

West Region

Year	Unit	2021A	2022A	2023E	2024E	2025E	2026E	2027E
Revenue	NOK Million	221.4	222.3	223.20	224.11	225.02	225.94	226.86
% of growth	*%*		*0.41%*	*0.41%*	*0.41%*	*0.41%*	*0.41%*	*0.41%*
Original Result	NOK Million	7.00	(8.00)	7.06	7.09	7.11	7.14	7.17
Profit Margin		*3%*	*-4%*	*3%*	*3%*	*3%*	*3%*	*3%*
New Saved Cost	NOK Million			17.02	29.63	32.23	35.05	38.14
New Expense				1.48	0.01	0.01	0.01	0.01
Tax Rate				22%	22%	22%	22%	22%
Result				12.12	23.11	25.13	27.34	29.74
New Result				**19.18**	**30.19**	**32.24**	**34.48**	**36.91**
New Operating Margin				**9%**	**13%**	**14%**	**15%**	**16%**

East Region

Year	Unit	2021A	2022A	2023E	2024E	2025E	2026E	2027E
Revenue	NOK Million	231.7	259.5	290.64	325.51	364.56	408.30	457.29
% of growth	*%*		*12.00%*	*12.00%*	*12.00%*	*12.00%*	*12.00%*	*12.00%*
Original Result	NOK Million	29.30	35.30	38.14	43.50	48.28	54.32	60.70
Profit Margin	%	**13%**	**14%**	**13%**	**13%**	**13%**	**13%**	**13%**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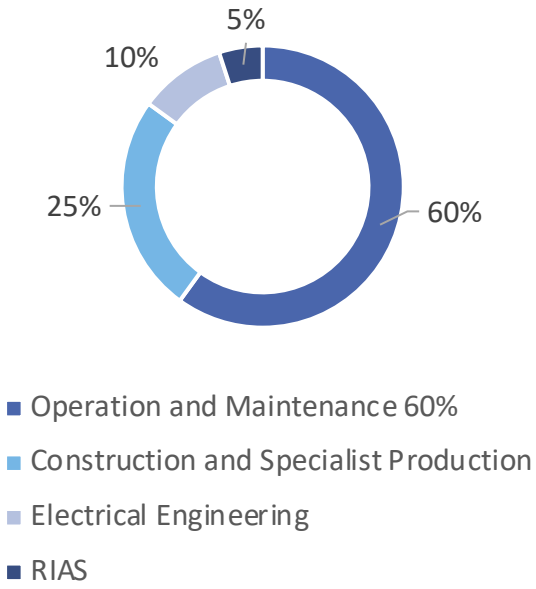
Mesta's business areas

Revenue by business area



Operation and Maintenance

- O&M of national and county roads
- Biggest customers: Public Roads Administration and county municipalities

Construction and specialist production

- Projects and construction work involving roads, tunnels, railways

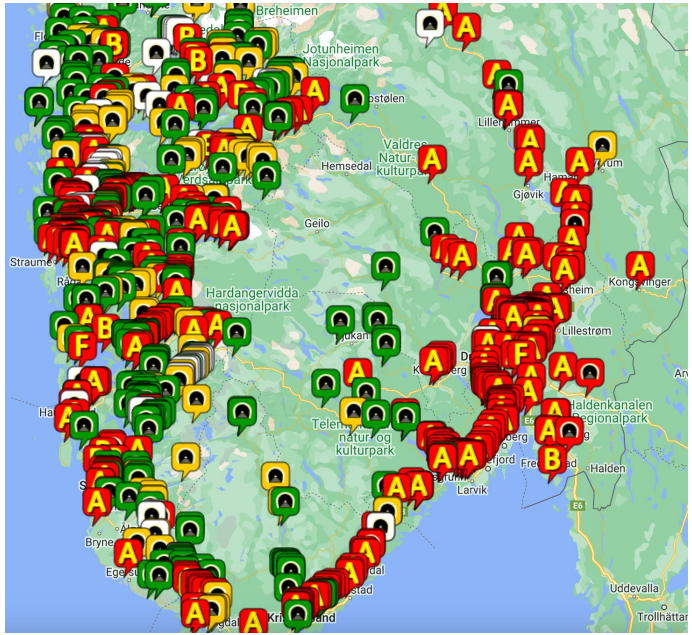
Electrical Engineering

- Maintenance, new builds and rehabilitation
- Strong reputation in tunnel rehabilitation

RAIL/RIAS

- construction projects on the railway

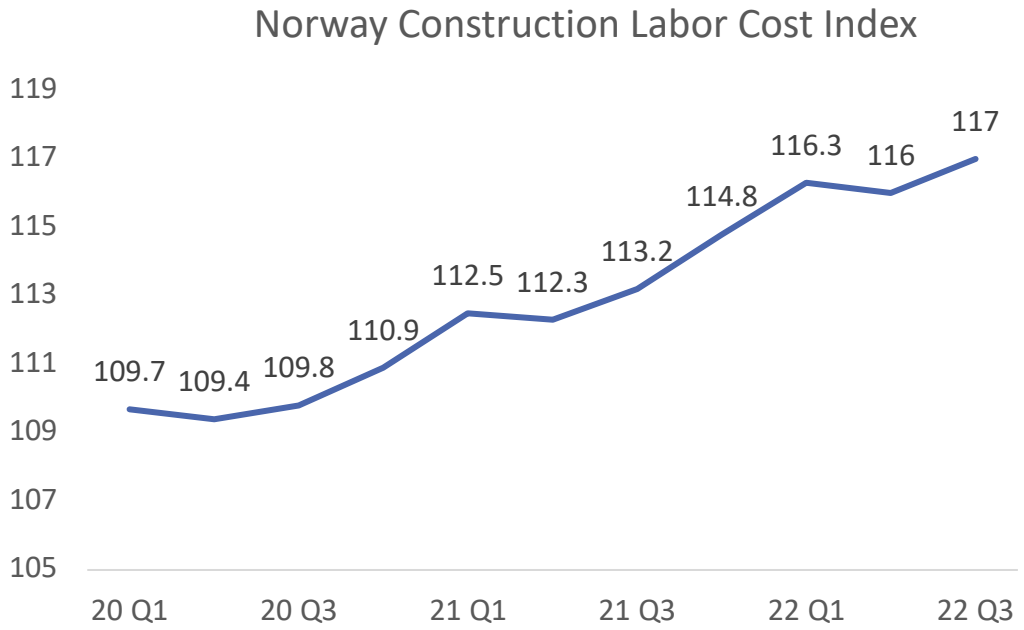
Labor inefficiency



Green icons: Tunnels for cyclists
A, F: tunnels prohibiting for cyclists

East: Less tunnels for commercial use >> **Harder transportation** of materials and workers to finish projects

Raising labor cost



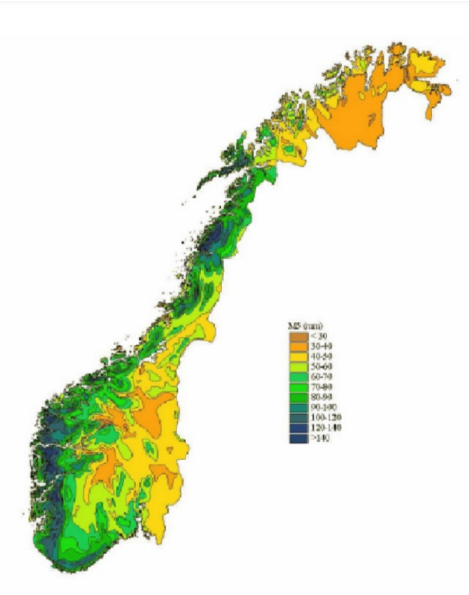
No. of employees

Category	Construction East			Construction West		
	Jan.22	Jan.23	Difference	Jan.22	Jan.23	Difference
Area Manager	1	1	0	1	1	0
Project Leader	3	3	0	3	3	0
Site leader	9	12	3	10	8	-2
Forman	7	8	1	2	4	2
Admin Consultant	1	1	0	0	0	0
Geomatic engineer	2	3	1	5	7	2
Project engineer	0	0	0	0	0	0
Junior engineer	0	1	1	2	1	-1
Project support	1	1	0	1	2	1
Skilled worker	21	24	3	32	33	1
Worker	12	13	1	9	7	-2
Apprentice	1	1	0	6	4	-2
Assistant worker	0	0	0	8	8	0
Total	58	68	10	79	78	-1

Fig 2 Number of employees

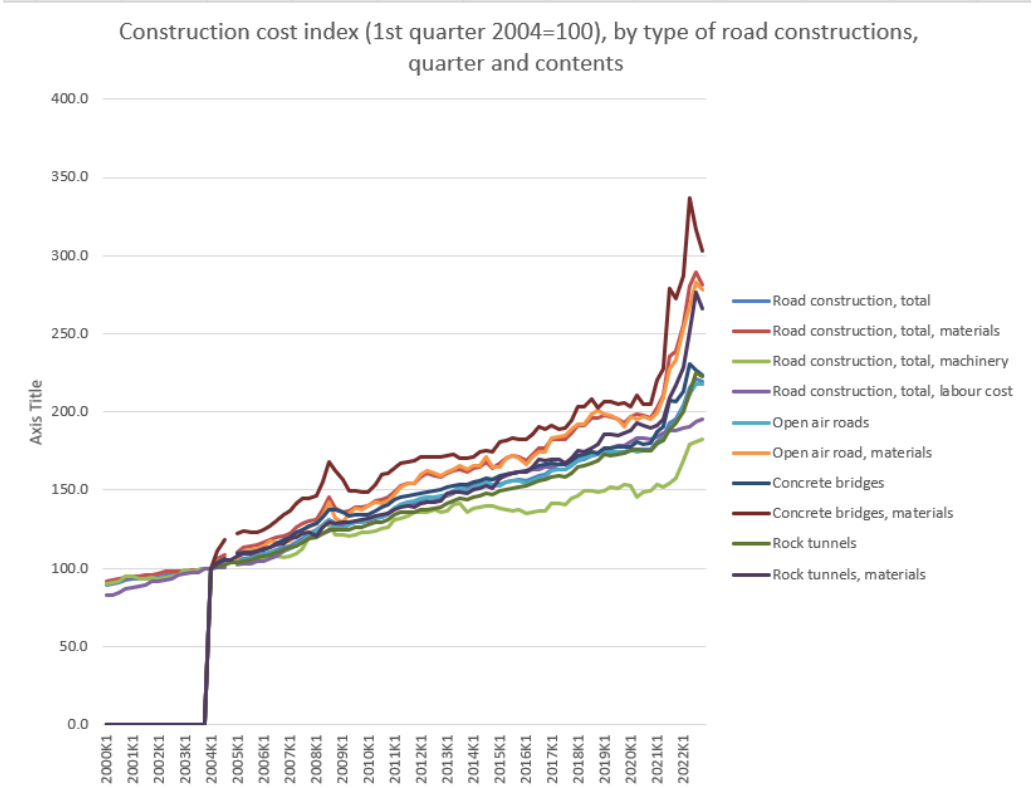
Comparison of natural hazard between the West and the East

Estimated frequency of extreme weather events in Norway(including extreme precipitation)



- The largest increase in the annual precipitation has occurred in Western Norway and large parts of Central and Northern Norway.
- In Western Norway there has been a tendency of increasing 1-day rainfall extremes during the later decades. In the other parts of the country there has been very small changes.
- Late autumn floods will be more common, especially in basins in west Norway

Increasing construction cost



Western Norway bridge:

Usually made with more expensive concrete

- Hardanger Bridge: concrete pylons and an aerodynamic closed bridge girder
- Fantebrauta bridge: concrete

Eastern Norway bridge:

Usually made with less expensive steel and iron

- Yipsilon bridge: steel
- Aamot bridge: cast iron