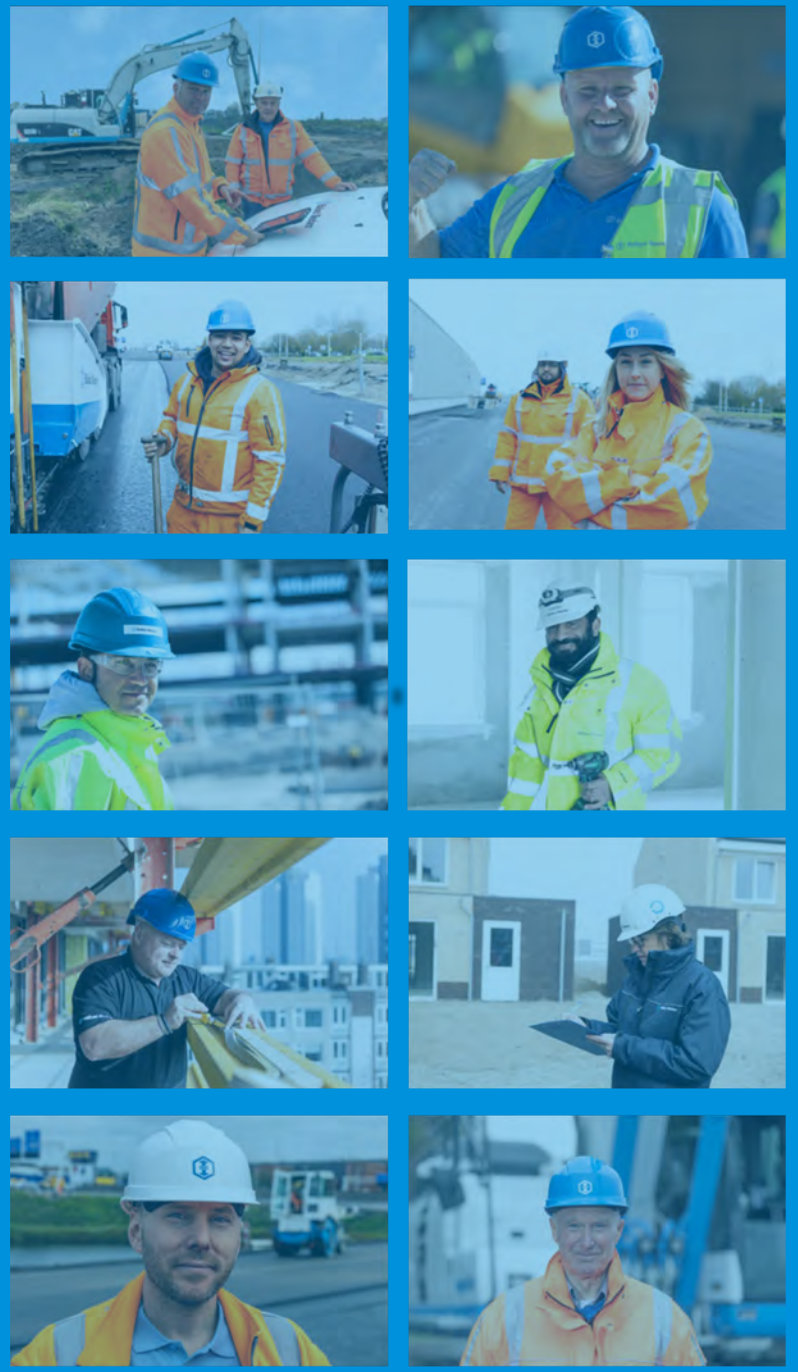
How Can Early Contractor Involvement Make A Construction Project More Time- and Cost-Efficient?

Baltic and Black Sea Ports & Shipping 2022
Exhibition & Conference, Palanga, Lithuania

Leo Wallin, Commercial Manager, Ballast Nedam

We Challenge to Improve



About

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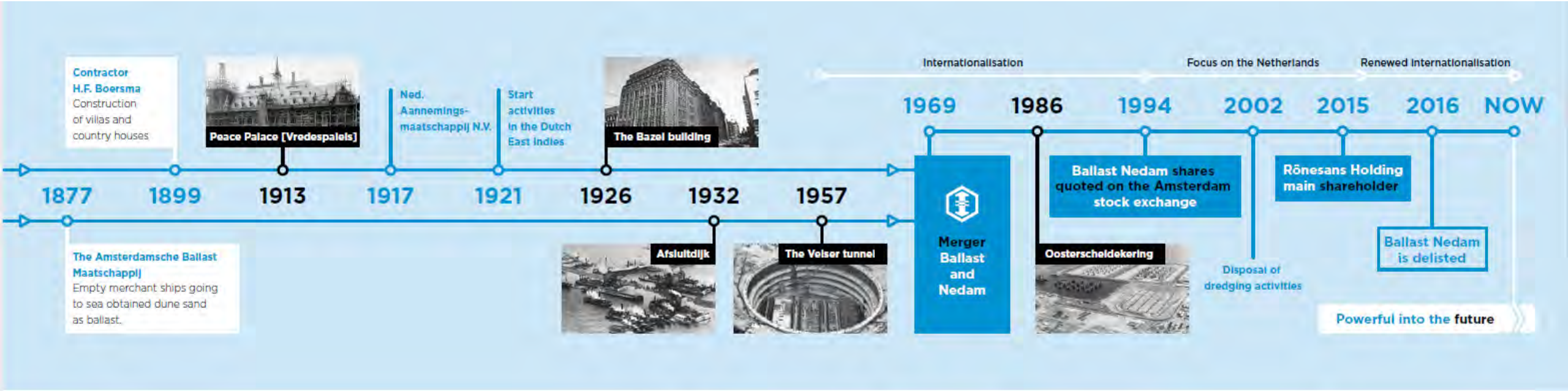
Ballast Nedam History



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Landmark Projects

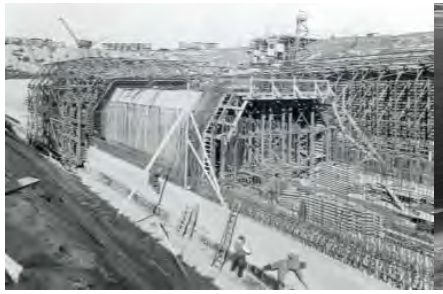
Afsluitdijk
The Netherlands

King Fahd Causeway
Bahrain/Saudi Arabia

Storebaelt Bridge
Denmark

Confederation Bridge
Canada

Schiphol Airport
The Netherlands



Velsertunnel
The Netherlands

Oosterscheldedam
The Netherlands

A15 Botlekbridge
The Netherlands

Erasmus Hospital
The Netherlands

Hollands Diep High Speed Rail Bridge
The Netherlands

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Business Units

Ballast Nedam(*)

Construction

Composed of more than 13 business units(**):

- Regional companies provide general building services in different regions in the NL.
- Centralised companies conduct large building, infra construction across the NL.
- Speciality companies carry out specific, mostly smaller projects, such as parking lot construction, road maintenance, marine works.
- BN International carries out construction projects outside the NL.

Development

Concentrates on mixed-use and more complex projects. It creates integrated, creative and high-profile solutions for the building environment through investment, management and development of projects based on both public and private partnerships.

Development is also in charge of land plots and development rights and integral area developments.

Industrial

Concentrates on designing and delivering specific support constructions for process installations, such as foundations, concrete works, steel structures, infrastructure and other construction tasks for industrial projects.

Concessions

Operates at the front of the chain to attract project funding and offers commercial expertise. It develops, manages and monitors integral DBFM(O)/PPP contracts in the area of infrastructure and real estate. The focus is on long-term commitment to these projects.

(*) BN NV strategically and financially maintains and supervises these business units.
(**) BN Construction has 5 technical services departments.

The Sum of Specialties

Decentralized and specialized organizational units

We act with the agility of a local player, with the strength of a large construction company. How do we do that? Ballast Nedam is made up of decentralized and specialized organisational units. This allows our dedicated teams to fully focus on their markets and clients. The sum of our divisions and business units together offers our clients and partners a valuable total solution.

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International Presence

Europe	Africa	Asia	Caribbean
The Netherlands	Ghana	Sri Lanka	St Maarten
The United Kingdom	Tanzania		St Lucia
Belgium	Kenya		Aruba
France			Curaçao
Sweden			
Luxembourg			
Turkey			
Germany			
Switzerland			

Orderbook 2020

~ € 1,4 billion

Number of employees 2020

1800

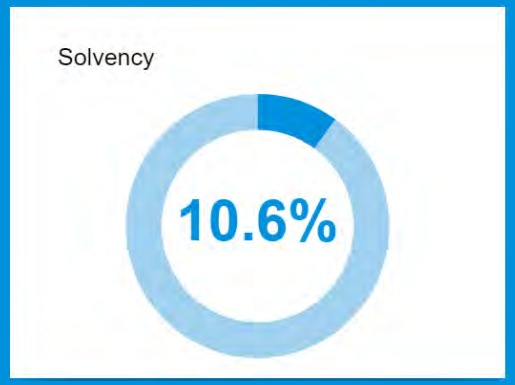
Revenue 2020

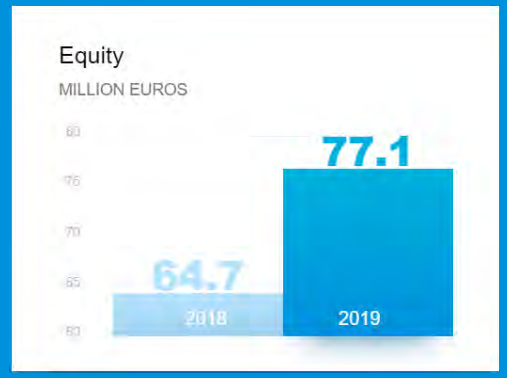
> € 945 million

Solvency ratio 2020

>24,1%

Facts & Figures





Marine Works

- One of our focus areas are on large or complex marine projects
- We have a large track record all over the world on marine projects
- Long Dutch history on marine projects with inhouse experts and equipment

Afrika harbour

Amsterdam

Peberholm Artificial Island

Denmark

PPP Blankenburg Connection

Rotterdam

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Construction of Princess Amalia Harbour quays

Partners: Hochtief & van Oord
Construction period: 2021-2024

2.4 km of intelligent quay wall of which:

- 1,825 metres of deep sea quay, with a retaining height of 29 metres.
- 160 meters of inland shipping quay
- 360 metres of revetment
- dredging the quays to a depth of more than 20 metres below New Amsterdam Water Level (NAP)
- a back crane track, founded on piles, will be constructed over a length of approximately 1.8 kilometres,

The quay wall is going to be ‘smart’ and is equipped with sensors that monitor forces and deformations. This enables technicians to eg. monitor movements of the quay wall when ships dock.

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Blankenburg Connection

Construction Time: 2018 - 2024
Partners: DEME and Macquarie Capital
Contract form: Design, Build, Finance and Maintain (DBFM)
Project size: € 1.1 Billion

4 kilometres of motorway of 2x3 lanes
Sunken intersection with the A20
Sunken motorway
510-metre land tunnel
safety dam
945-metre immersed tunnel of two tubes with 3 lanes each

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Two Approaches to benefitting from the contractor's experience in an early phase of a project

1. Early Contractor Involvement
2. Construction Team Agreements

Early Contractor Involvement (ECI)
Main Concepts

Background

Early studies show 10% savings on project time and 7% on cost

Popularity increase since early 2000s

Common in UK, Australia and New Zealand. Increasing popularity in Norway and Sweden.

Benefits

Contractor can be involved as early as the feasability stage if required

Opportunity for added innovation, buildability, sequencing, management of risk and HSE

Flexibility for projects with high complexity, difficult to detail sufficiently in tender phase

Main concepts

Two phase approach

Open books, cost-plus structure

Target price to be agreed upon prior to entering phase 2

Incentives for cost-savings

Possibility to terminate contract and put traditional design-and-build (eg. FIDIC Silver) on market if not possible to proceed

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Early Contractor Involvement (ECI) Timeline

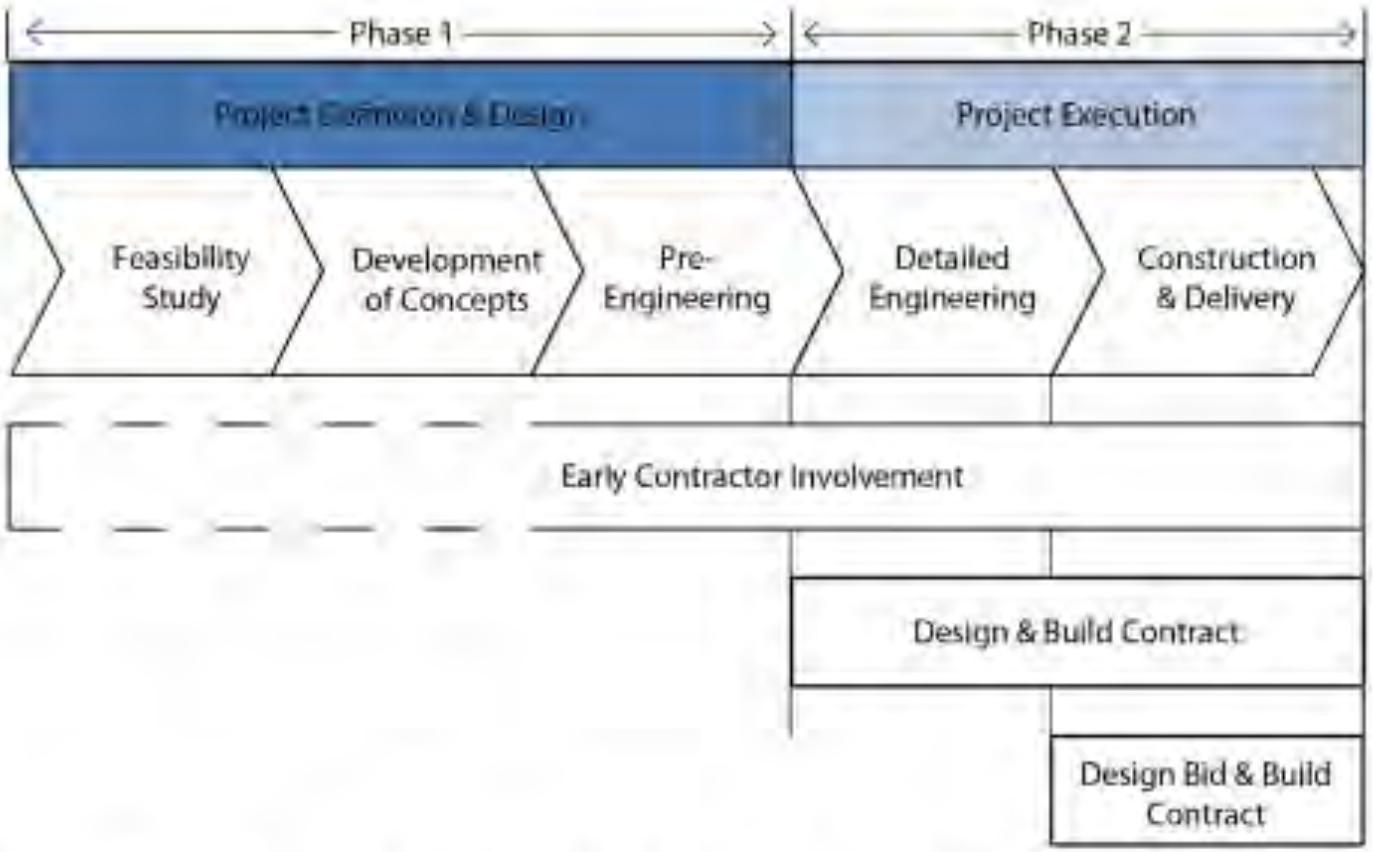

Figure 2 Project activities in relation to contractor involvement in different delivery approaches (adapted from Walker and Lloyd-Walker, 2014).

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Early Contractor Involvement (ECI)

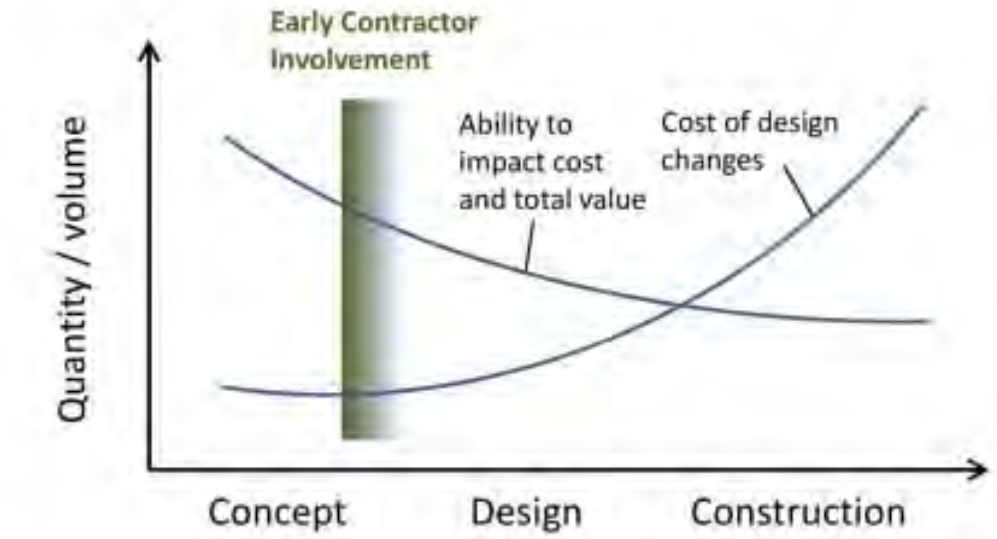

Figure 3 Cost and ability to impact the design (Lahdenperä, 2010).

Figure 4 Principles of target price contracting.

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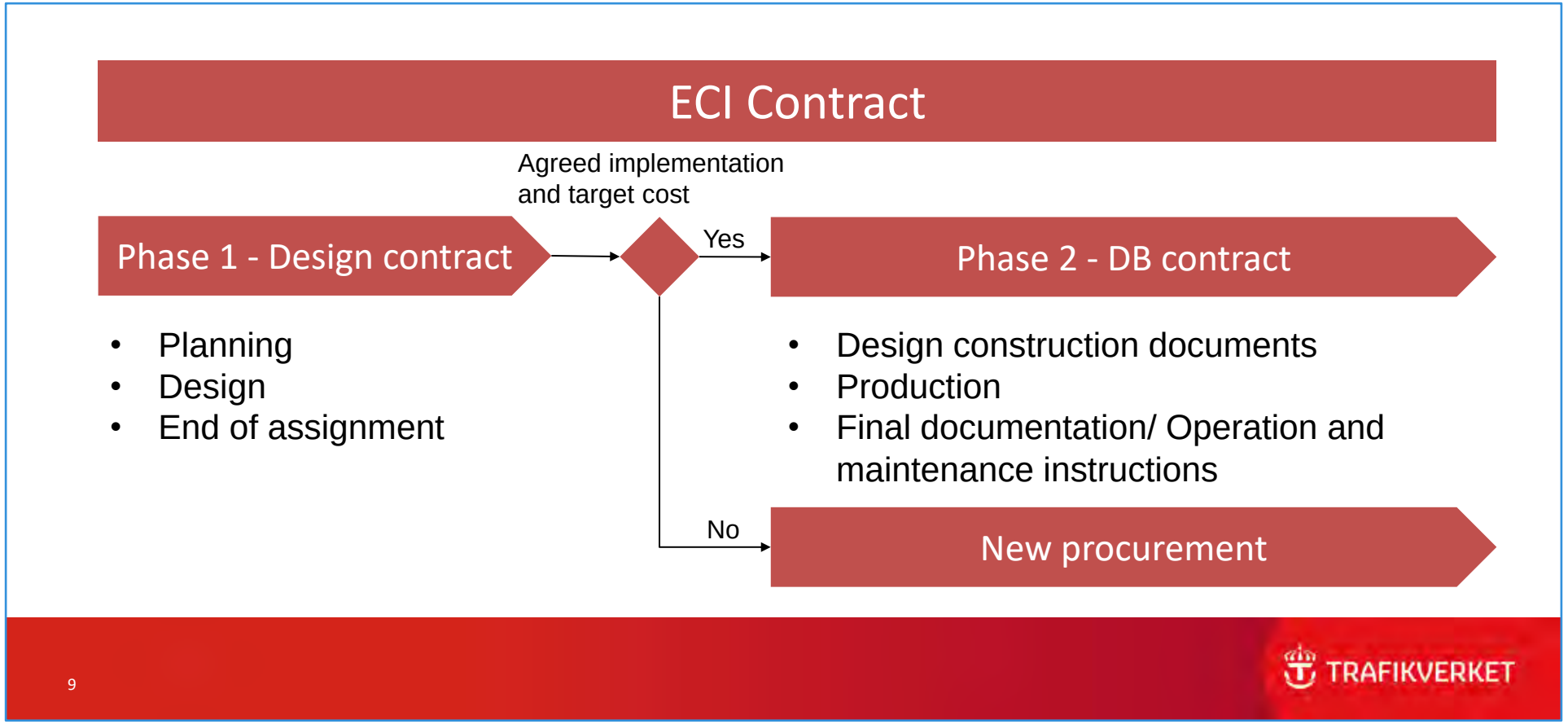
Early Contractor Involvement (ECI)
Example from Sweden



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Evaluation model

General remarks

Evaluation model based on capacity, capability and preparedness for phase 1 and phase 2

Examples of evaluation criteria

Execution plan for phase 1 including rates per hours

Work process for a final target price after phase 1 (transparency / co-operation between client, co-owner and contractor)

Cost-plus fee (”translated” to risk-shared payment structure between client and consortia)

How to be sustainable? In terms of use of material, equipment, etc.

Organisational structure and skills of key individual

Risk management. If the project contains large risks; for example the environmental impact assessment: how will the contractor work to mitigate these risks?

Early Contractor Involvement Evaluation model - Sweden

Case study of 7 ECI procurements of the Swedish Transport Administration including assessment of evaluation criteria. https://www.procsibe.se/wp-content/uploads/2020/11/Delrapport_S3_publicerad.pdf

	Olskroken	Centralen	Vårgårda – Ribbingsberg	Lund – Flackarp	Varberg	Vinsta	Solna – Sundbyberg
Standard Contract	Design + Design & Build	Design + Design & Build	Design & Build	Design & Build	Design & Build	Design & Build	Design + Design & Build
Contractor's fee	7-12% Winner: 7%	7-12% Winner: 7%	11.81%	Target price for phase 2	8-12% Winner: 8%	8-12% Winner: 8%	8-12% Winner: 8%
Quality Criteria	Collaboration Execution plan phase 1 Execution plan phase 2	Collaboration Execution plan phase 1 Execution plan phase 2	Organisation Collaboration Conflict mgmt Method for target price Risk management Key individuals	Collaboration Organisation Execution phase 1 Execution phase 2 Safety	Collaboration Execution plan phase 1 Execution plan phase 2	Collaboration Quality Management Execution Management	Organisation Nuisance Collaboration Safety Technology and Innovation
Pages – quality submission	30	30	60	40	60	No limit	300
Designer decided together with client post award	No	No	No	No	No	Yes	Yes
Compensation scheme	Cost-Plus with Bonus Scheme	Cost-Plus with Bonus Scheme	Cost-Plus with Bonus Scheme	Cost-Plus with Bonus Scheme	Cost-Plus with Bonus Scheme	Cost-Plus with Bonus Scheme	Cost-Plus with Bonus Scheme
Client share initial contract value estimate	No	No	Yes	No	Yes	Partly	No

1. Early Contractor Involvement
2. **Construction Team Agreements**

Construction Team Agreement

Overall goals

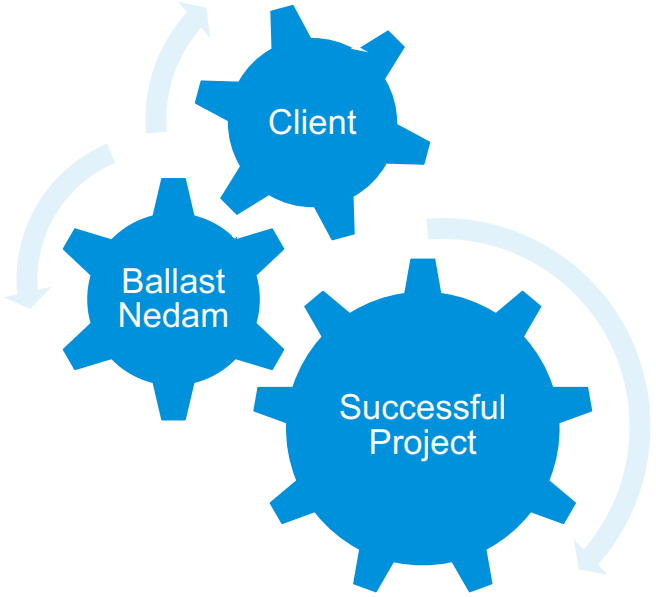
- Working together to a feasible project
- Deliver a binding offer on XX date
- Reach financial close in QX year

Possible approach

- Instead of including a civil works contractor in a one-phase co-ownership and construction contract, the co-owner can add a construction team for a two-phase contract
- The construction team works in an advisory capacity optimising the project early on
- If certain optimisation targets are reached, an option is activated to award a construction contract as a second phase
- If not, the construction team is reimbursed for their work and the construction contract(s) put on market

Exmamples of Ballast Nedam's experience with the approach

- Strekdammen for Eurus/Yard
- Nearshore windfarm Blauw



- Strategic Partnerships
- Flexible & LEAN
- Lower Costs

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Construction Team Agreement
Benefits of Suggested Approach

Cost Optimisation

- significant construction costs optimisation through an enhanced design, decisions are made together

Local Content

- Step by Step Approach and where possible development of packages for subcontracting to local parties, overseen by Ballast Nedam

Construction Methodology

- Construction methodology checked throughout the design process for local achievability and supply of equipment and materials.

International Standards

- An integrated approach to achieve the Client's goal of developing a facility of national and/or international standards

Planning

- a significant reduction in change order/claims etc. which reduces overall costs to the project and a better controllable planning

Experience

- a team with in-country experience that can be supplemented with dedicated experts

Local Content

- In additional to functional requirements, continuous attention for constructability and availability of materials.

Development Pace

- a shortened period for final design, construction pricing and potentially also financing, as these activities take place simultaneously.

Insight in Pricing

- a more thorough understanding of the project costs by client, design consultants and general contractor due to an open estimating process;

Integration

- a better understanding of the scope of works and the differentiation with other sections

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Windpark Maasvlakte 2 – Lot 2 BoP

Name: Windpark Maasvlakte 2

End Client: Rijkswaterstaat

Employer: Eneco

BoP Contractor: Ballast Nedam

Contract : UAV-GC Contract / Early Engagement

Park size: 116 MW

No. of WTGs: 22 turbines (type Vestas)

Soft Sea Defence : 12x V162 (Foundation – Monopile)

Hard Sea Defence : 1x V162 (Foundation – Monopile)

Hard Sea Defence : 9x V117 (Foundation – Concrete)

BN Scope: Balance of Plant

Foundations, Cables, Hardstands, Roads

Start Execution Q1 2022

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Windpark Blauw – Lot 2 BoP

Name: Windpark Blauw

End Client: Swifterwint (Vattenfall /

BoP Contractor: Ballast Nedam

Contract : UAV-GC Contract / Early Engagement

Location : Lelystad, Netherlands

Natura2000 Area

Park size: 132 MW

No. of WTGs: 24 turbines (type GE 5.5 - landbased)

BN Scope: Balance of Plant

Foundations, Cables, Hardstands, Roads

Distance to shore: 2 km

Water depth: 4 - 5 m

Start Execution Q1 2022

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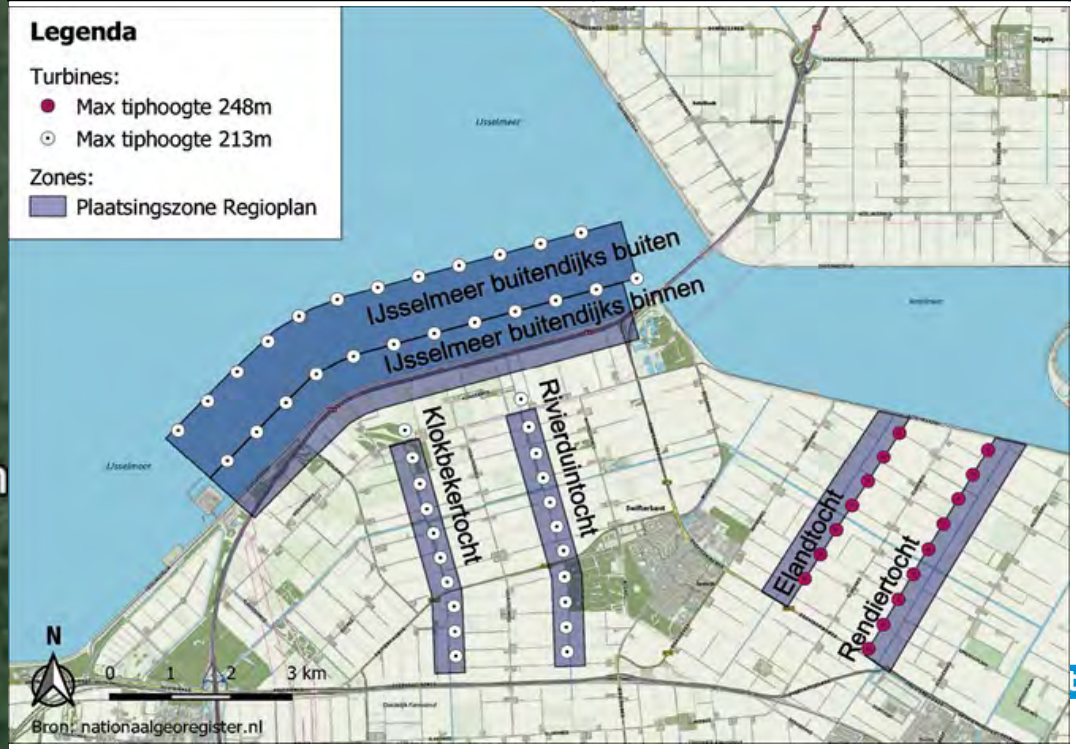
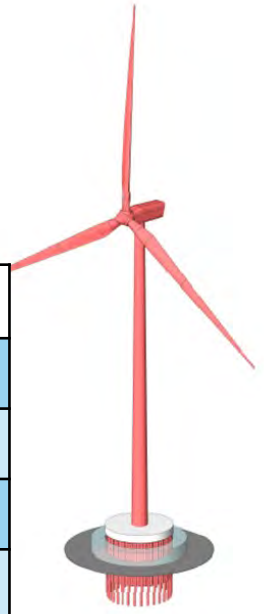
Project location

Nearshore WP Blauw – Lelystad - Netherlands	
Capacity	GE 5.5MW – 135 MW
Number of turbines	24
Distance to shore	1 km
Minimum/Maximum water depth (LAT)	3 – 5 m





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Construction Team Agreement
Lessons Learned

Client & Contractor took full ownership at start of project

- Started with Construction Team Agreement (CTA)
- Open dialogue and alignment on budget, planning and requirements
- Contractor entered into exclusive commitments with suppliers and subcontractors at CTA
- Design & construction methods were approved during CTA

Strong focus on people and relationships

- Invest in the right people and knowledge at the start of the project
- Create high standard of safety awareness during design till installation activities
- Invest in team building and open communication mind set on a continuous basis

Pro-active and creative attitude for robust solutions to learn adapt and mitigate risks

- Create dare to share sessions and learn from other team members
- Create suitable solutions which fit the scope of works
- Discuss issues and be transparent to meet the project objectives

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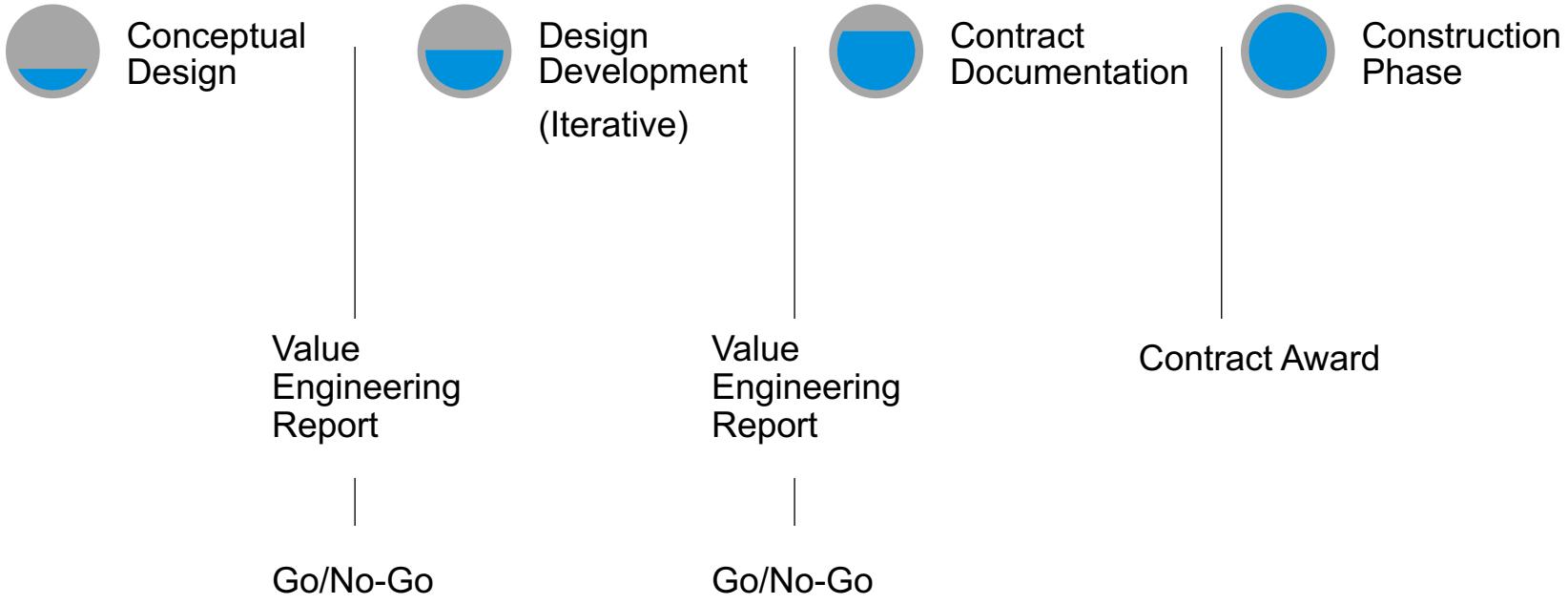
Construction Team Agreement
Design Phasing



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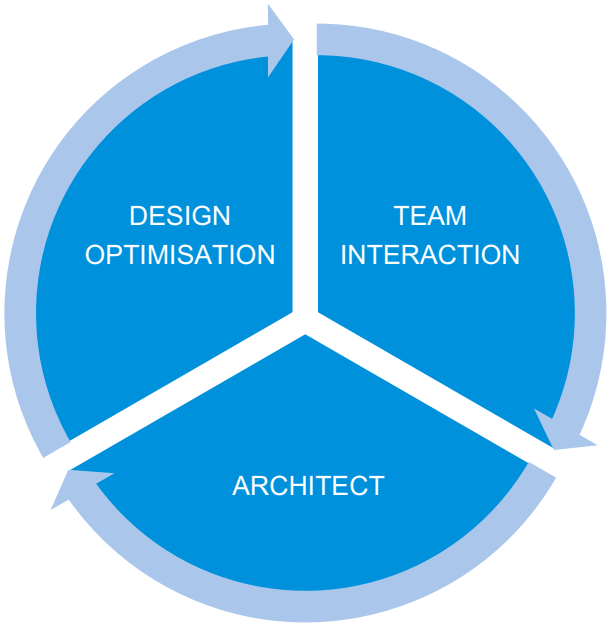
Formation of a Construction Team

In the Construction Team approach the Client generally takes on the Project Management function and appoints the General Contractor. (and Architect if applicable).
Once the team members are selected the terms under which the Project Manager, General Contractor and, if applicable, Architect participate in the team are fixed and appropriate contractual agreements can be finalised. Any Building Team members other than the Client normally work on a professional fee basis.
The final selected team will work under the Project Manager to carry out the technical development of the facility.
In general the design process starting after receipt of conceptual documents can be split into three phases as (shown on the next slides). Our building team starting point is the Conceptual design.
Every design phase is concluded with an estimate together with a value engineering report. The Project Manager make will make the “Go or No-Go” decision after consultation with the Client. The Project Manager will also promptly take action/decisions on any recommendations made by the Building Team members. In addition, each portion of the Execution Design shall be remeasured and completed to a revised Contract Price, prior to the execution.



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Design Development

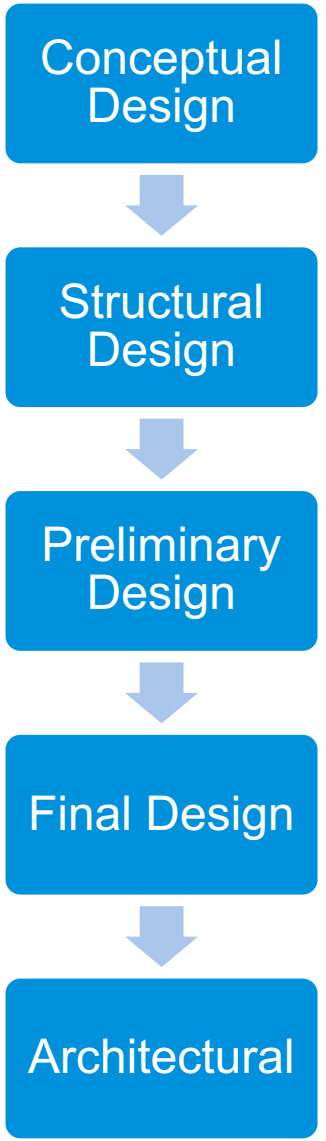
In general the design process starting after receipt of conceptual documents can be split into three phases as (shown on the next slides). Our building team starting point is the **Conceptual design**.

In the **structural design phase**, the broad lines of the developments are conceived by juxtaposing different options of models and weighing up the most optimal overall composition of the building. All items such as investment costs and exploitation costs are included.

A model of these options is further advanced to a **preliminary design**. Added to this are the more detailed requirements that ensure that the Client's expectations are met. Also in this phase, different options will be considered and choices will be made that do justice to the requested requirements.

In the next phase, **the final design**, everything will be completed in terms of materialization, after which drawings will be made that will be used for the implementation and construction.

In all phases of this design process, an architect may absorb all the information from the other consultants and achieve an optimization, if applicable. All comments from the client/developer, who is an inseparable part of the entire team, are continuously integrated.



Ballast Nedam Main Input during Design Phase

A. Construction Cost Estimating.

As part of the Building Team, we would open our estimates and the estimating process to all of the Building Team members. In this way everyone is able to get a better understanding of the costs associated with the various building components. These are gradually developed in line with the development of the project with milestone estimates, eg a conceptual estimate.

The construction of a project is generally executed on the basis of a fixed price construction contract. BN also provide project management services during construction. The ability to recognise, analyse and immediately react to problems encountered during the construction is necessary when executing a project. Similarly, the logistical aspects of executing a project requires project management and a tight process control

B. Value Engineering

BN will conduct value engineering exercises during the preparation of the preliminary estimates and will submit a value engineering report together with this estimate. BNIP value engineering reports will assist the Building Team in establishing options to lower the project cost while maintaining project quality.

C. Scheduling

BNwill prepare schedules integrating the team's design efforts and the required construction phasing. BNIP also prepares a construction schedule incorporating a detailed schedule for all project activities, including realistic activity sequences and duration’s, allocation of labour and materials, processing of shop drawings and samples, and delivery of products requiring long lead-times.

D. Project reporting

At the end of the design phase BN issues a report recommending adjustments to the project budget and recommends a future course of action. It is the responsibility of the project manager to issue a “Go or No-Go” decision and to instruct BNIP and the team on the intended future course of action.

Benefits of involving a civil works contractor early

- Ballast Nedam can take a role in your project in a flexible way adapted to your preferences.
- We believe in a close collaboration to ensure that our bid is suited to your key project goals and pre-conditions.
- Through this close collaboration, we can lower project costs while ensuring a successful project delivery.

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We can break new ground together by working together early on!

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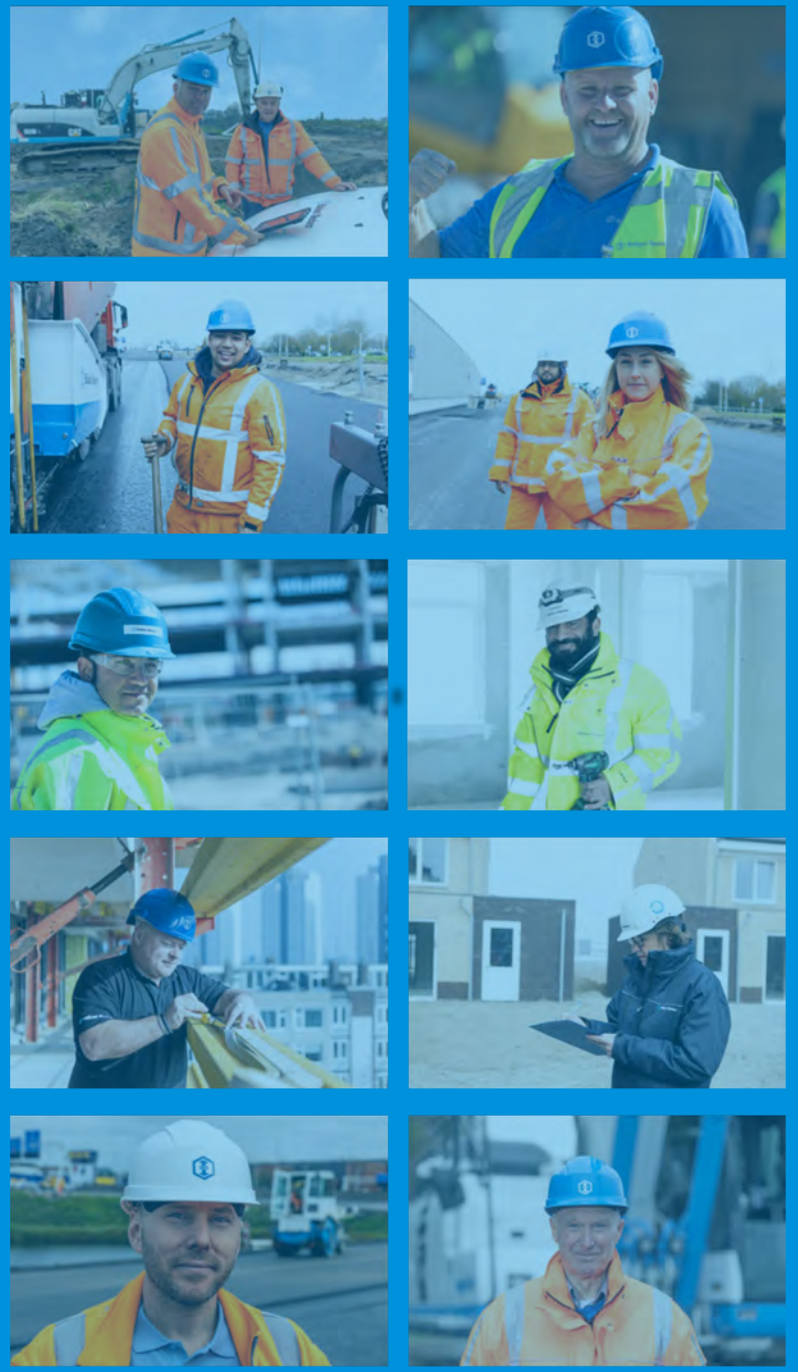

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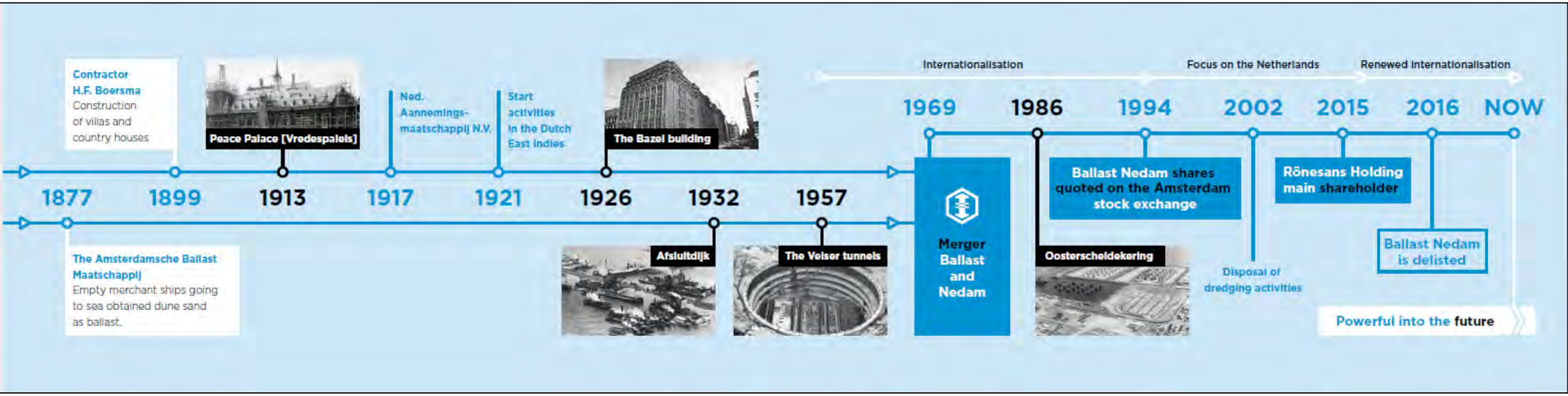

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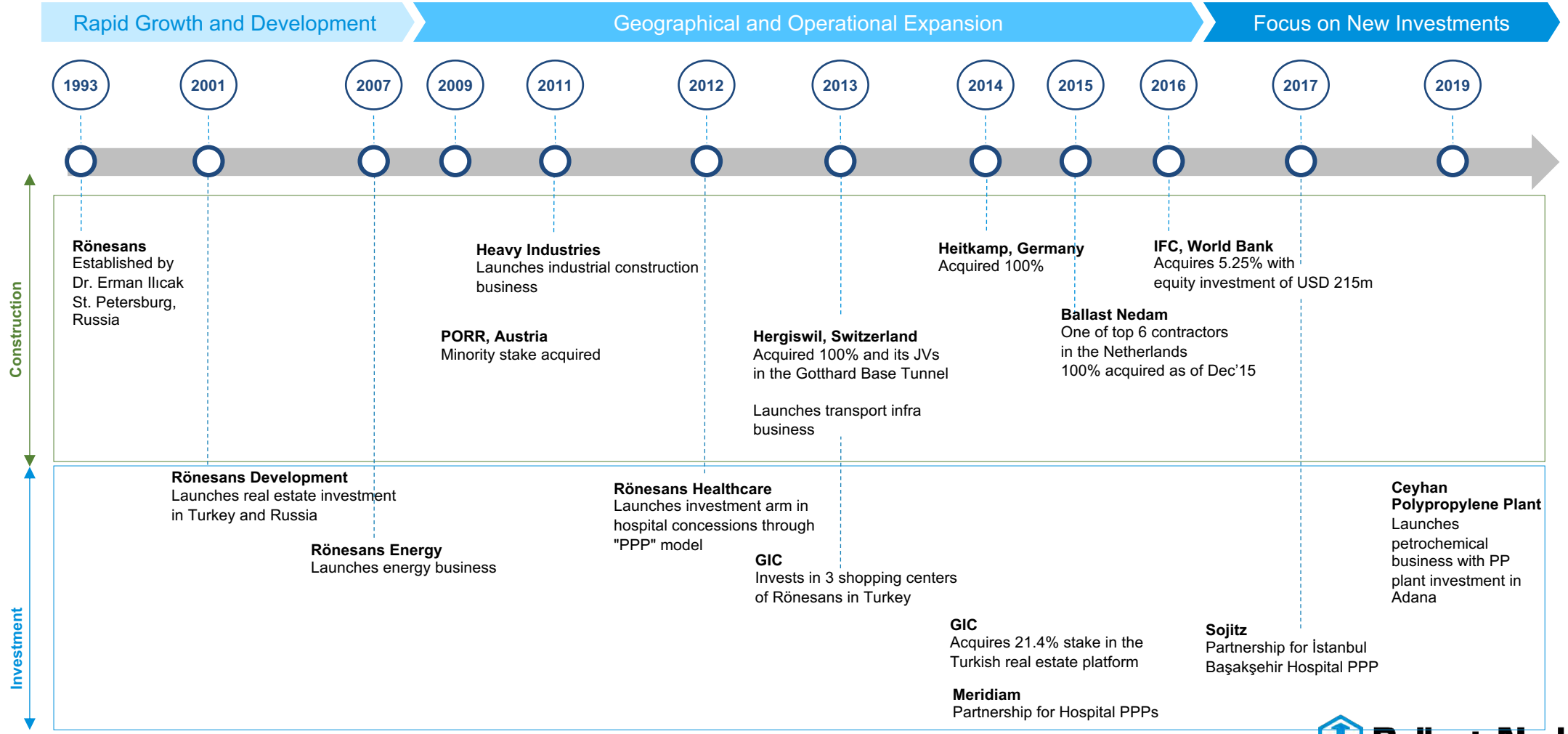
HEITKAMP

Construction Swiss GmbH

RÖNESANS HOLDİNG

Key Milestones



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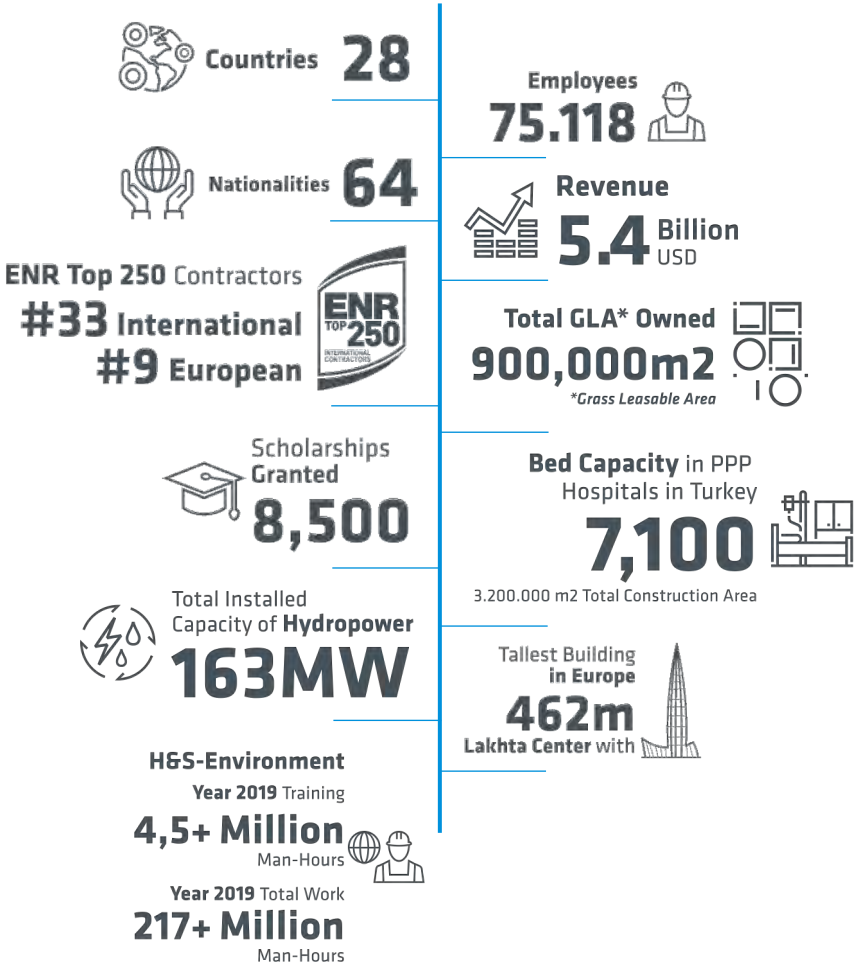
Key Figures



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