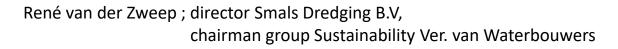


Sustainability in small scale dredging equipment













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- Introduction Smals Dredging
- Sustainable developments in equipment
- Trends
- Conclusion





WATERBOUWERS

Association of hydraulic engineers

independant branche organisation

- Representation of all kinds of companies out of the hydraulic engineering business
- 88 members : builders, consultants

Activities of the members:

construction and maintenance of navigation channels, rivers, coastal defence, embankment strengthening, dredging, soil remediation, construction and maintenance of 'wet' infrastructure



WATERBOUWERS

Hydraulic engineering is, on one hand, part of **shipping (maritime industry)** and on the other hand part of **the building industry**.

Therefore the people working here have to deal with the differences in policy of clients like RWS, Waterboards, Harbour Authorities etc, differences in (inter)national sustainability targets verus inland legislation









Introduction Royal Smals

- since 1885
- 3 departments; aggregates, rental, dredging
- 85 people
- turnover €25 mio
- 'Smals Naturally'; www.smals.com
- Focus of Smals Dredging on inland small scale dredging in Western Europe











- big and all-round fleet of 20 cutter suction dredgers and deep win dredgers
- Projects in pits (aggregates) harbors, navigation channels, lakes (maintenance dreding)
- 7 dredgers full electric
- Strategy and development of the vessels is of high importance!





Electric Dredgers

Advantages

- Proven technology
- Operations comparable to diesel driven dredgers (no extra education needed)
- No CO2 emissions, No noise (eco-friendly, environment friendly)







Electric Dredgers

Disadvantages

- Limitation in distance to power connection (cable max 700m')
- Because of the above reason only applicable for pits and lakes
- Limited availability of electricity network
- Solution: Generator set (with biodiesel..)





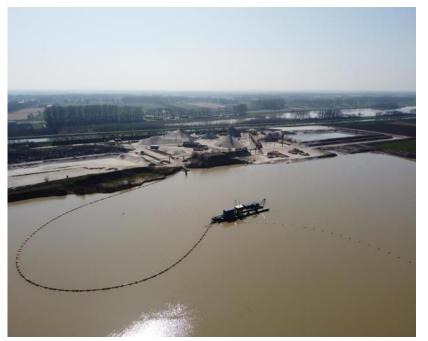


Electric Dredgers, EZZ IJsselmeer

Existing diesel driven dredgers are converted to full electric dredgers Investment approximately €1,5 million ! Required power







Electric Dredgers

Operation not always more expensive.

Hardly maintenance needing Depending on project site ; only 1 skipper needed (instead of 2) Higher expenditures and divestments due to higher investments.







Electric infrastructure

Infrastructure

- Costs of installing cables(10kV) still very high (>> €100 000,-)
- Delivery time > 1 year
- Paperwork due to obligatory permits and licences.







Diesel driven dredgers

- Provided with Blue Diesel B30
- 30% less CO2 emission
- Blue Diesel
- Blue diesel is very well applicable on land; hardly on water
- Not yet applicable abroad.







Search for alternative techniques

- Current batteries too weak for todays needed power
- According to Smals Dredging 2021 calculations: €2 million investment in batteries needed to provide one small CSD of energy fully autonomously
- Charging / changing batteries is a complicated and time-consuming activity







Search for alternative techniques



- Fuel-efficient diesel motors with sufficient power (stage V) not yet available
- Combination motors, compatible to development of hydrogen





Steps forward in sustanability by our government

Recent tenders by Dutch Authorities:

- Rijkswaterstaat, Spijk Harbour: demand zero emission but that is depending on private electricity connection.
- Drainage Board Rijnland: Langenaarse Plassen: demand zero emission Consequence: construction electricity cable 100% in contract price and delivery time of the project far too late
- Geertjesgolf: Initative together with 5 companies
 Very long preparation time but because of the big amount of aggregates in the project scope: 100% electric dredging is done!







Application of Sustanabiltiy in the short run

Yes, that is doable

- Preparation of the current infrastructure on deliverance of electricity
- Use of alternative fuels







Application of Sustanabiltiy in the long run

- United common policy by authorities give some insurance to the market to do sustainable investments
- (Financial) appreciation of sustainable solutions
- The speed of sustainabilisation has to be in line with the technical developments
- Subsitution of equipment can happen fast, taking into account the capacity of the suppliers and the depreciation periods.





thank you for your attention!





rvdz@smals.com

