Specification of vessel types for use cases – final

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Advanced, Efficient and Green Intermodal Systems

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Executive Summary

In this report, D4.3, the vessel concepts for the three use-cases have been presented.

First the requirements arising from each use case were summarized, studying previous deliverable reports of the AEGIS partners and communicating frequently with them. In each use-case specific scenarios were defined, which require certain types of vessels. To fulfil these requirements the following vessel concepts were developed and specified in detail.

For UC-A (Shortsea shipping, containerized cargo):

- A mother vessel (SSS operation along Norwegian west coast) with
  - a capacity of 1100 TEU
  - an on-board cargo handling system consisting of two 3J-cranes
  - a propulsion system based on a methanol combustion engine with battery support for peak shaving and short distance electrically sailing
  - a low to medium autonomy level (1–2 according to IMO), autonomy-ready
- A daughter vessel 1 (operating between Hitra and the Trondheim fjord or Hola) with
  - a capacity of 100 TEU
  - an on-board cargo handling system consisting of a movable gantry crane
  - a fully electric propulsion system with swappable batteries (FEU-sized containers)
  - a high autonomy level (3–4 according to IMO)
- A daughter vessel 2 (operating between Hitra and the Trondheim fjord or Hola) with
  - a capacity of 60 TEU
  - a moveable on-board cargo handling system in terms of an autonomous light-weight reach stacker
  - a fully electric propulsion system with swappable batteries (FEU-sized containers))
  - a high autonomy level (3–4 according to IMO)
- A daughter vessel 3 (operating between Hitra and the Trondheim fjord or Hola) with
  - being a pushed convoy, with a pusher and different versions of barges
  - the barges having a capacity of 36 TEU or 450 dwt
  - no on-board cargo handling system
  - a fully electric propulsion system with swappable batteries (FEU-sized containers) for the pusher or fixed installed batteries for the barges
  - a high autonomy level (3–4 according to IMO)

For UC-B (Inland waterways, RoRo – trailers):

- An IWW vessel CEMT class VI (transversal loading) with
  - a capacity of 69 trailers
  - an on-board cargo handling system consisting of three movable gantry cranes to lift 29 double-decker cages
  - a fully electric propulsion system with swappable batteries (3 FEU-sized rollable units)

    - a high autonomy level (3–4 according to IMO)
- An IWW vessel CEMT class IV (longitudinal loading) with
    - a capacity of 21 trailers
    - no on-board cargo handling system (an autonomous tag unit (ATU) could be on-board)
    - a fully electric propulsion system with swappable batteries (3 TEU-sized rollable units)
    - a high autonomy level (3–4 according to IMO)
- An IWW vessel CEMT class II (longitudinal loading) with
    - a capacity of 10 trailers
    - no on-board cargo handling system (an autonomous tag unit (ATU) could be on-board)
    - a fully electric propulsion system with swappable batteries (2 TEU-sized rollable units)
    - a high autonomy level (3–4 according to IMO)

For UC-C – AHL (Shortsea shipping in the Kattegat/Skagerrak region, RoRo – trailers):

- A RoRo vessel (electric version) with
    - a capacity of 55 trailers
    - no on-board cargo handling system
    - a fully electric propulsion system with swappable batteries (5 FEU-sized rollable units)
    - a low to medium autonomy level (1–2 according to IMO)
- A RoRo vessel (methanol version) with
    - a capacity of 55 trailers
    - no on-board cargo handling system
    - a methanol-electric propulsion system
    - a low to medium autonomy level (1–2 according to IMO), autonomy-ready

For UC-C – VH (Combined SSS and IWW in the Baltic and European hinterland, dry bulk, containers, project cargo):

- A SSS-IWW multi-purpose vessel with
    - a capacity of 3,500 t or 156 TEU
    - an on-board cargo handling system consisting of a movable gantry crane to lift the hatch covers and move the wheel-house
    - a methanol-electric propulsion system
    - a low to medium autonomy level (1–2 according to IMO), autonomy-ready

Synergies between the vessel concepts developed for one use case might be used in other use cases, e.g. the mother vessel in UC-A might also be used in UC-C.