

SYSTEM FOR PRODUCING, STORING AND TRANSPORTING ELECTRICAL ENERGY

The current application relates to a system for producing,
5 storing and transporting electrical energy, in particular to
an electrochemical system for bunkering large-scale energy.
The current application further relates to a method for pro-
ducing, storing and transporting electrical energy, in partic-
ular to an electrochemical method of bunkering large-scale en-
10 ergy.

In current operations, large-scale solar, wind and marine en-
ergy farms are connected via subsea cables from generation
sources to grid at point of use. However, the investment cost
15 is expensive, and often it is not practical to install subsea
cables for smaller, distributed and far-distance renewable en-
ergy sources at sea.

Hydrogen in the compressed or liquefied forms, or as ammonia
20 or liquid organic carrier forms is recently promoted to use
for energy transport. However, the net energy efficiency is
low due to losses in conversion and transportation. Safety is
also a concern on use of hydrogen and ammonia in large-scale.

25 Lithium-Ion Batteries (LIB) can be used for energy transport.
However, the power and energy capacity are coupled as an en-
tire energy pack in LIB. It requires cooling during charging
and discharging operation. Fire safety is another concern on
use of LIB in large-scale.

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It is an object of the present specification to provide an im-
proved system of producing, storing and transporting electri-
cal energy.

A proposed system for producing, storing and transporting electrical energy comprises:

at least one first electrochemical storage device comprising at least one cell stack using electrolyte being stored in at least one container, wherein the at least one first electrochemical storage device is functionally connectable to an electricity generation device, wherein charged electrolyte in the container is transportable by means of a first transfer pump into a container on a floating body, wherein the container is transportable by means of the floating body to a location of use, wherein at the location of use the charged electrolyte in the container is transportable by means of a second transfer pump into at least one container of a second electrochemical storage device comprising at least one cell stack using electrolyte being stored in the at least one container, wherein the at least one second electrochemical storage device is functionally connectable to a load device at the location of use, wherein discharged electrolyte in the container is transportable by means of the second transfer pump into the container on the floating body, wherein the container is transportable to the electricity generation device, wherein the discharged electrolyte is transportable by means of the first transfer pump into the at least one container of the first electrochemical storage device, wherein the discharged electrolyte is rechargeable by means of the electricity generation device.

In this way, electrical energy can efficiently be generated at the location of generation, stored and transported on a large scale to the location of use.

A proposed method for producing, storing and transporting electrical energy comprises the following steps:

- transporting charged electrolyte being stored in at least one container of at least one first electrochemical storage device comprising at least one cell stack using electrolyte of at least one container at a location of generation, wherein the charged electrolyte is transported by means of a first transfer pump into a container on a floating body,
- transporting the container by means of the floating body to a location of use,
- transporting the charged electrolyte by means of a second transfer pump into at least one container of a second electrochemical storage device comprising a cell stack using electrolyte of the at least one container,
- transporting discharged electrolyte in the at least one container of the second electrochemical storage device by means of the second transfer pump into the container on the floating body,
- transporting the container by means of the floating body to the location of generation,
- transporting the discharged electrolyte by means of the first transfer pump into the at least one container of the first electrochemical storage device, and
- charging the discharged electrolyte by means of the electricity generation device at the location of generation.

In one embodiment of the proposed system, the container on the floating body is an Intermediate Bulk Container. By means of said type of container, there is provided a good isolation between several containers. Furthermore, such containers are practical, stackable and can easily be replaced and/or moved.

In yet further embodiments of the proposed system, the floating body is at least one of the following: barge, vessel,

floating platform, chemical barge, bunker vessel, tanker vessel. A wide variety of different floating bodies can thus be used to support the proposed system.

5 In yet a further embodiment of the proposed system, several containers, and/or bunker tanks and/or large tanks are transportable by means of the floating body. In this way, an amount of transported electrical energy can significantly be increased.

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According to yet a further embodiment of the proposed system, the electrochemical storage device is a Vanadium Redox Flow Battery. However, the proposed system can also include other types of organic and inorganic flow batteries.

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According to yet a further embodiment of the proposed system, the electricity generation device comprises at least one of the following: tidal turbine, solar photovoltaic energy panel, wind turbine, wave turbine. Therefore, various different energy sources are possible to be used in the context of the proposed system.

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The subject matter of the present specification will now be explained in more detail with respect to three figures,

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wherein:

Figure 1 shows a conceptual overview of an embodiment of a proposed system,

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Figure 2 shows a conceptual overview of a further embodiment of the proposed system, and

Figure 3 shows a conceptual overview of a further embodiment of the proposed system.

In the following description, specific features are provided to describe embodiments of the proposed system. It shall be apparent to a skilled person, however, that the embodiments may be practised without such specific features and/or other corresponding specific features.

It is noted that in the following description numerical values of embodiments are merely exemplary. Hence, a skilled person will use other numerical values for systems, devices, components, elements, materials, etc. without departing from the scope of the proposed system.

Some parts of embodiments, which are shown in figures, may have similar parts. Similar parts may have same names or similar part numbers with a primary number and/or with a letter. The description of such similar parts also applies by reference to other similar parts, where appropriate, thereby reducing repetition of text without limiting the disclosure. The proposed system can solve challenges addressed earlier, e.g. by:

- 1) Lowering capital costs of energy transmission within the applicable range of users, e.g. instead of laying submarine cables

- 2) Providing access of safer low-carbon energy in ready-to-use electrical form more efficiently than alternatives such as hydrogen and/or hydrogen carriers and/or Li-ion batteries

- 3) Providing a sustainable energy storage and transport solution for a generation and transport of renewable energy

The proposed system uses existing and familiar marine assets to carry out the proposed method, either via containers, chemical barges, bunker vessels or large tanker vessels in the future, depending on the applicable transferred package. It can
5 carry out the proposed method via mechanical pumping of the electrolyte, similar to the current bunkering mode of marine fuel.

Other upsides of the proposed system are e.g.:

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1) ability to affordably scale up the capacity of the energy storage by increasing either a number of containers or using bigger electrolyte tanks

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2) flexibility to re-route and provide green electricity to new users within the economically feasible range of the renewable energy site

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3) Independently increasing a capacity of a flow battery stack if more electrical power is needed

By means of the proposed system, the following effects can be realized:

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a) Reduction of costly transmissions of renewable energy (e.g. via cables, submarine cables, pipelines, etc.) from a remote installation to users with a flexible and cost-effective solution

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b) Reduction of Greenhouse Gas (GHG) emission for current energy users by creating direct access to clean, renewable energy

c) Provision of a sustainable storage solution of intermittent power for renewable energy generators

In the proposed system energy transport takes place using Vanadium electrolyte as an energy carrier in an exemplary scale of 50 kWh energy transport to end-users on shore or at ports. At a location of electrical energy generation, there can be provided a tidal turbine. Vanadium Redox Flow Battery (VRFB) systems and corresponding electrolyte can be used for storage of electrical energy and transport of electrical energy.

By means of the proposed system, there is provided a commercial service of "electron bunkering" of clean renewable energy harvested at off-shore renewable energy farms to end-users. In this way, it is possible to sell renewable energy harnessed at sea or onshore to customers on the mainland, on islands, etc.

This is in line with the notion of decentralised energy and distribution in the future. The proposed system can be tailored according to a partnership along a value chain from energy generators, storage and distributors to end users.

Fig. 1 shows a schematic view of a first embodiment of a proposed system 100 for producing, storing and transporting electrical energy. As can be seen, there is an energy harvesting source with an electricity generation device 1, for example formed as a tidal turbine.

The proposed system 100 produces clean renewable electrical energy e.g. offshore at sea, by a flow of tidal currents, by means of wind flow, etc. and can represent a turnkey solution for a clean energy supply to offshore islands, microgrids and the emerging blue economy.

The small and versatile tidal turbine of the proposed system 100 supports multiple deployment options, such as e.g. below a bridge, on a mooring platform, on existing fixed infrastructures, on mobile platforms and water
5 crafts, arranged in arrays, etc. The small-scale tidal turbine can harness mechanical flow energy from low flow velocity resources, which are predominantly located in coastal waters and/or in remote island locations, large scale tidal turbines can be proposed as energy generation
10 for system 100 in the future.

Apart from a tidal turbine as energy generation, renewable energy can also be harvested using solar panels (photovoltaics), wind turbines, wave turbines, etc.

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Tidal energy generation can, for example, be performed on a platform at sea. The produced electrical energy is then stored in a first electrochemical storage device 10, preferably built as a Vanadium Redox Flow Battery with corresponding electro-
20 lyte.

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Harvested renewable electrical energy is stored by means of electrochemical cell stacks 11 into redox flow battery electrolyte at the generation sources at remote locations.

A Redox Flow Battery and its corresponding electrolyte may particularly be Vanadium Redox Flow Battery and Vanadium Electrolyte. As alternatives there can also be used any other organic or inorganic flow batteries.

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Fully charged electrolyte is stored in container 12. For the sake of improved intelligibility, a container 12 with charged electrolyte is illustrated blackened and a container 13 with discharged electrolyte is illustrated as a line drawing.

For the purpose of transportation to a different location, the fully charged electrolyte in the container 12 is pumped by means of a first transfer pump 20 into a container 31 on a floating body 30. The floating body 30 may for example be im-
5 plemented as a barge, a vessel, a floating platform, a water craft, a chemical barge, a bunker vessel, a tanker vessel etc. The floating body 30 is equipped with a container 31, which can be used to transport the fully charged electrolyte to the location of use 60.

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For the purpose of transportation, the floating body 30 can be used, in order to transport several containers or large tanks 31. At the location of use 60, the charged electrolyte is pumped by means of a second transfer pump 40 into at least one
15 container 52, of at least one second electrochemical storage device 50.

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The charged electrolyte in the container 52 is used by an electrochemical cell stack 51 of the second electrochemical storage device 50 is then discharged caused by reason of usage of electrical energy of various applications.

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Afterwards, used and discharged electrolyte is transported by means of the second transfer pump 40 into the container 31 of
the floating body 30. Afterwards, by means of the floating body 30, the discharged electrolyte is transported to the location of the electricity generation device 1 for the purposes of recharging.

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The electrolyte may have a long lifetime of up to twenty years and does not degrade during the storage and distribution of renewable energy over the lifetime.

The energy harvesting source with the electricity generation device 1 comprises e.g. a tidal turbine with a generator (not shown) being connected therewith. Tidal energy can thus be used to drive the tidal turbine in order to generate electrical energy in order to charge the liquid electrolyte.

In this way, there is performed a harvesting, a storage and a transport of offshore renewable energy using Vanadium Electrolyte and a Vanadium Redox Flow Battery system on the stationary floating platform 70 and a distribution of charged Vanadium Electrolyte to end users at the location of use 60.

For the purpose of improved intelligibility, only one first electrochemical storage device 10 and only one second electrochemical storage device 50 have been illustrated. It goes without saying, however, that also more than one first and second electrochemical devices 10, 50 can be used at the sites of generation and usage.

The proposed method can be used for cost-effectively transporting harvested energy from off-shore renewable farms at remote locations to the targeted end-users on the mainland or islands.

Targeted end users can be utility owners and selling energy directly to businesses such as ports and terminal operators. Targeted end users also include industries using electrical power located in coastal land and water areas.

Global need for net zero emissions and a utilization of renewable energy to achieve this can be driving factors for end users of the proposed system 100.

The proposed method utilizes a distinct feature of decoupling energy storage media, i.e. the electrolyte, from the electrochemical cells stacks in redox flow battery system. Electrical energy is stored in the electrolyte, and only electrolyte containers will be transported using marine vessels during the transfer of electrical energy from harvesting sources to end-users.

Instead of using whole energy packs like other types of electrochemical storage devices (e.g. Lithium-ion batteries) by means of a redox flow battery the electrochemical cells stacks are deployed at the point of harvesting for charging and at the location of use for discharging. To this end, only the electrolyte is transported in a container by means the floating body.

Instead of swapping battery packs or using cables to transfer electrical energy from charged battery packs to discharged battery packs like at other types of battery, by means of the redox flow battery the electrical energy will be transferred by means of mechanical pumping of the charged and discharged electrolyte at generation sources and locations of use.

The proposed system 100 can use existing and familiar marine assets to carry out the operation, either via containers, barges, bunker vessel or large tanker vessel in the future. The proposed method is similar to current methods of bunkering fuel in the sea for marine vessels, wherein the transported energy can be sold to end-users on shore of islands. This process might be named as "electron bunkering".

The proposed system 100 can thus implement an electron bunkering concept using a Redox Flow Battery System and using an

electrolyte transport from a generation source to a location of use and vice versa.

At the generation source at remote location (Islands, coastal
5 and offshore), renewable energy is harvested using appropriate
energy converters, e.g. ocean energy using tidal turbine in
this illustration. Renewable energy can also be provided in
the form of solar energy, wind energy, tidal energy which can
be harvested using solar panels, wind-, wave- or tidal tur-
10 bines.

Referring to Fig. 1, electrochemical electricity storage de-
vice in the form of a Redox Flow Battery (RFB) system consists
of electrochemical cell stacks 11 and electrolyte containers
12, 13. At least one electrochemical storage device 10 is in-
15 stalled at the generation source and at least a second elec-
trochemical storage device 50 is installed at the location of
use 60.

20 At the energy harvesting source, harvested energy is charged
by means of electrochemical cell stacks 11 and stored in the
electrolyte. Fully charged electrolyte is then transferred us-
ing first transfer pumps 20 from electrolyte container 12 in
the first electrochemical storage device 10 to empty electro-
25 lyte transfer containers 31 on the floating body 30.

At the location of use 60, the charged electrolyte is trans-
ferred using second transfer pumps 40 from the at least one
electrolyte container 31 on the floating body 30 to at least
30 an empty electrolyte container 52 at the electrochemical elec-
tricity storage device 50. The end-user can thus utilize the
stored electrical energy of electrolyte by discharging it via
electrochemical cells stacks 51 for equipment, facilities,
loads, etc. of various applications.

At the location of use 60, fully charged electrolyte is stored in container 52. For the sake of improved intelligibility, a container 52 with charged electrolyte is illustrated blackened and a container 53 with discharged electrolyte is illustrated as a line drawing.

Used and discharged electrolyte can be transferred using the second transfer pumps 40 from the electrolyte container 53 in the electrochemical electricity storage device 50 at the location of use 60 to the empty electrolyte tanks 31 on the floating body 30. The used and discharged electrolyte is then transported from the location of use 60 to the energy harvesting source 1 by the marine vessel 30 for the purposes of re-charging.

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The floating body 30 is transporting the charged and discharged electrolyte to and from between energy harvesting source 1 and location of use 60 back and forth.

Redox Flow Battery (RFB) used in the proposed system 100 has a distinct feature of decoupling of power and energy capacity. Electrochemical cell stacks 11, 51 are for charging and discharging of electrical energy to and from the electrolyte. Harvested renewable energy is charged into the electrolyte at the generation sources 1. Stored energy in the electrolyte is discharged to the loads at the location of use 60. As an energy carrier, only the electrolyte is transported by the floating body 30, thereby lowering costs of transportation and/or infrastructure.

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This is accomplished by the following facts:

- Electrolyte is much safer to handle than Lithium-Ion Battery and Hydrogen carriers

- The approach is similar to the current methods of bunkering fuel at sea for marine vessels

- It has the ability to affordably scale up the capacity of energy storage by increasing volume of electrolyte tanks. Independently, the power rating of the electrochemical stacks can be increased if more power is needed

- It has the flexibility to reroute and provide green electricity to new users within the economically feasible range of the renewable energy sites

Fig. 2 will be explained by means of the below itemized list of embodiments. Fig. 2 shows a schematic view of a further embodiment of the proposed system for producing, storing and transporting electrical energy.

The proposed system produces clean renewable electrical energy e.g. offshore at sea on a stationary floating platform 70, by a flow of tidal currents 1. The produced electrical energy is then stored in a first electrochemical storage device 10, preferably built as a Vanadium Redox Flow Battery with corresponding electrolyte, on the stationary floating platform 70. Harvested renewable electrical energy is stored by means of electrochemical cell stacks 11 into redox flow battery electrolyte at the generation sources on a stationary floating platform 70 at remote locations.

Fully charged electrolyte is stored in container 12.

Fig. 3 will be explained by means of the below itemized list of embodiments. Fig. 3 shows a schematic view of a further embodiment of the proposed system for storing and transporting electrical energy.

For the purpose of transportation to a different location, the fully charged electrolyte in the container 12 is pumped by means of the first transfer pump 20 into containers 31 on a floating body 30, a bunker vessel or a tanker vessel in this example. The bunker vessel or the tanker vessel 30 is equipped with containers 31, which can be used to transport the fully charged electrolyte to the location of use 60. The containers 31 can be bunker tanks on the bunker vessel or tanker tanks on the tanker vessel in order to transport large quantities of charged or discharged electrolyte.

Summarizing, there is provided a cost-effective energy storage and distribution to be the key in enabling mass adoption of renewable energy in direct electrical form around the world.

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In the proposed concept, there will be used a redox flow battery, in particular vanadium redox flow battery for storage and distribution. Harvested renewable energy will be charged via VRFB stacks, which is the electrochemical cells, into Vanadium electrolyte placed in tanks at the generation source. The fully charged electrolyte will be then transported in tanks by barge or vessel to the location of use.

At the location of use 60, the energy stored in charged electrolyte will be discharged via cell stacks 51 and electricity will be provided for the loads for various applications. The discharged electrolyte will be transported back to the generation source for recharging. The electrolyte can be reused for up to twenty years.

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At the flow battery, the energy is stored in electrolyte and the electrochemical cells are power converters for charging and discharging energy to and from electrolyte.

Potential customers may include e.g.:

- Utility
- Business-to-business (B2B)
- 5 - Project developers (Energy Farms)

The potential opportunity for sustainable marine energy technologies is enormous. Tidal hydrokinetic energy in particular, is a potentially unlimited renewable source for energy generation, due to its complete predictability and availability.

10 These vast resources, used in the context of the proposed system and method, enable tidal energy converting devices to help meet energy demands globally.

REFERENCE LIST

	1	electricity generation device
	10	first electrochemical storage device
5	11	cell stack
	12	container
	13	container
	20	first transfer pump
	30	floating body
10	31	container on floating body
	40	second transfer pump
	50	second electrochemical storage device
	51	cell stack
	52	container
15	53	container
	60	location of use
	70	stationary floating platform
	100	system

Itemized list of embodiments:

The following is a list of embodiments:

- 5 1. System (100) for producing, storing and transporting electrical energy, comprising:
at least one first electrochemical storage device (10)
comprising at least one cell stack (11) using electrolyte
being stored in at least one container (12, 13), wherein
10 the at least one first electrochemical storage device (10)
is functionally connectable to an electricity generation
device (1), wherein charged electrolyte in the container
(12) is transportable by means of a first transfer pump
(20) into a container (31) on a floating body (30)
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2. System, wherein the container (31) is transportable by
means of the floating body (30) to a location of use (60),
wherein at the location of use (60) the charged electro-
lyte in the container (31) is transportable by means of a
20 a second transfer pump (40) into at least one container (52)
of a second electrochemical storage device (50) comprising
at least one cell stack (51) using electrolyte being
stored in the at least one container (52, 53).
- 25 3. System, wherein discharged electrolyte of the container
(53) is transportable by means of the second transfer pump
(40) into the container (31) on the floating body (30),
wherein the container (31) is transportable to the elec-
tricity generation device (1), wherein the discharged
30 electrolyte is transportable by means of the first trans-
fer pump (20) into the at least one container (13) of the
first electrochemical storage device (10), wherein the
discharged electrolyte is rechargeable by means of the
electricity generation device (1).

4. System (100), wherein the container (31) on the floating body (30) is an Intermediate Bulk Container.
5. System (100), wherein the floating body (30) is at least one of the following: barge, vessel, floating platform, chemical barge, bunker vessel, tanker vessel.
6. System (100), wherein several containers (31) and/or large tanks are transportable by means of the floating body (30).
7. System (100), wherein the electrochemical storage device (10, 50) is a Vanadium Redox Flow Battery.
8. System (100), wherein the electricity generation device (1) comprises at least one of the following: tidal turbine, solar photovoltaic energy panel, wind turbine, wave turbine.
9. Method for producing, storing and transporting electrical energy, comprising the steps:
 - transporting charged electrolyte being stored in at least one container (12) of at least one first electrochemical storage device (10) comprising at least one cell stack (11), wherein the charged electrolyte is transported by means of a first transfer pump (20) into a container (31) of a floating body (30),
 - transporting the container (31) by means of the floating body (30) to a location of use (60).
10. Method for producing, storing and transporting electrical energy, comprising the steps:
 - transporting the charged electrolyte by means of a second transfer pump (40) into at least one container (52) of a second electrochemical storage device (50) comprising a

cell stack (51) using electrolyte of the at least one container (52, 53).

11. Method for producing, storing and transporting electrical
5 energy, comprising the steps:
 - transporting discharged electrolyte of the at least one container (53) of the second electrochemical storage device (50) by means of the second transfer pump (40) into the container (31) of the floating body (30),
 - 10 - transporting the container (31) by means of the floating body (30) to an electricity generation device (1),
 - transporting the discharged electrolyte by means of the first transfer pump (20) into the at least one container (13) of the first electrochemical storage device (10), and
 - 15 - charging the discharged electrolyte by means of the electricity generation device (1).
12. Method for producing, storing and transporting electrical
20 energy, wherein the electrolyte is charged by means of at least one of the following electricity generation devices (1): tidal turbine, solar photovoltaic energy panel, wind turbine, wave turbine.
13. Method for producing, storing and transporting electrical
25 energy, wherein the electrolyte is transported by means of an Intermediate Bulk Container.
14. Method for producing, storing and transporting electrical
30 energy, wherein the electrolyte is used for a Vanadium Redox Flow Battery.
15. Method for producing, storing and transporting electrical
35 energy, wherein the container (31) is transported by means of least one of the following: barge, vessel, floating platform, chemical barge, bunker vessel, tanker vessel.

16. Method for producing, storing and transporting electrical energy, wherein several containers or large tanks (31) are transported by means of the floating body (30).

CLAIMS

1. System (100) for producing, storing and transporting electrical energy, comprising:

5 at least one first electrochemical storage device (10) comprising at least one cell stack (11) using electrolyte being stored in at least one container (12, 13), wherein the at least one first electrochemical storage device (10) is functionally connectable to an electricity generation
10 device (1), wherein charged electrolyte in the container (12) is transportable by means of a first transfer pump (20) into a container (31) on a floating body (30), wherein the container (31) is transportable by means of the floating body (30) to a location of use (60), wherein
15 at the location of use (60) the charged electrolyte in the container (31) is transportable by means of a second transfer pump (40) into at least one container (52) of a second electrochemical storage device (50) comprising at least one cell stack (51) using electrolyte being stored
20 in the at least one container (52, 53), wherein the at least one second electrochemical storage device is functionally connectable to a load device at the location of use, wherein discharged electrolyte in the container (53) is transportable by means of the second transfer pump (40)
25 into the container (31) on the floating body (30), wherein the container (31) is transportable to the electricity generation device (1), wherein the discharged electrolyte is transportable by means of the first transfer pump (20) into the at least one container (13) of the first electro-
30 chemical storage device (10), wherein the discharged electrolyte is rechargeable by means of the electricity generation device (1).

2. System (100) according to claim 1, wherein the container (31) on the floating body (30) is an Intermediate Bulk Container.
- 5 3. System (100) according to claim 1 or 2, wherein the floating body (30) is at least one of the following: barge, vessel, floating platform, chemical barge, bunker vessel, tanker vessel.
- 10 4. System (100) according to claim 3, wherein several containers and/or large tanks (31) are transportable by means of the floating body (30).
- 15 5. System (100) according to any one of the preceding claims, wherein the electrochemical storage device (10, 50) is a Vanadium Redox Flow Battery and/or another type of Flow Battery.
- 20 6. System (100) according to any one of the preceding claims, wherein the electricity generation device (1) comprises at least one of the following: tidal turbine, solar energy photovoltaic panel, wind turbine, wave turbine.
- 25 7. Method for producing, storing and transporting electrical energy, comprising the steps:
 - transporting charged electrolyte being stored in at least one container (12) of at least one first electrochemical storage device (10) comprising at least one cell stack (11), wherein the charged electrolyte is transported
 - 30 by means of a first transfer pump (20) into a container (31) on a floating body (30),
 - transporting the container (31) by means of the floating body (30) to a location of use (60),
 - transporting the charged electrolyte by means of a sec-
 - 35 ond transfer pump (40) into at least one container (52) of

a second electrochemical storage device (50) comprising a cell stack (51) using electrolyte of the at least one container (52, 53),

- transporting discharged electrolyte of the at least one container (53) of the second electrochemical storage device (50) by means of the second transfer pump (40) into the container (31) of the floating body (30),
- transporting the container (31) by means of the floating body (30) to an electricity generation device (1),
- transporting the discharged electrolyte by means of the first transfer pump (20) into the at least one container (13) of the first electrochemical storage device (10), and
- charging the discharged electrolyte by means of the electricity generation device (1).

8. Method according to claim 7, wherein the electrolyte is charged by means of at least one of the following electricity generation devices (1): tidal turbine, solar energy panel, wind turbine, wave turbine.

9. Method according to claim 7 or 8, wherein the electrolyte is transported by means of an Intermediate Bulk Container.

10. Method according to any of claims 7 to 9, wherein the electrolyte is used for a Vanadium Redox Flow Battery and/or for another type of Flow Battery.

11. Method according to any one of claims 7 to 10, wherein the container (31) is transported by means of least one of the following: barge, vessel, floating platform, chemical barge, bunker vessel, tanker vessel.

12. Method according to claim 11, wherein several containers and/or large tanks (31) are transported by means of the floating body (30).