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Salone Nautico in Venice heralds a new era

IWI's Alternative Fuels Committee is actively supporting the efforts to transition to clean energy boats in the Venice Lagoon, where air quality is seriously affected by the huge number of diesel engines. A significant step forward will be taken at Venice's second boat show in the Arsenale dockyard in June 2020, when an E-Regata will be held on the Grand Canal and in the lagoon, showcasing the technological advances made by boatbuilders and motor manufacturers.

DOCTOR FRANKENSTEIN'S LIBERATING scream in the hilarious film by Mel Brooks could be uttered by the elected representatives in Venice if only they were to tackle once and for all the problem of polluting engines, and to adopt the necessary measures. The solution to the current crisis in the lagoon was shown to be within arm's reach during a public meeting held in March 2019 in the San Leonardo Hall (Cannaregio quarter). The meeting was organised by seven recently-founded associations, under the title *Me manca l'aria* ('I haven't got enough air', or, more dramatically, 'I'm suffocating').

This was the timely message delivered at the start of the meeting by Salvatore Patti, head of the Venice observatory of air quality ARPAV, and Dr Cristiano Samuelli, who underlined the extent of air pollution, the presence of fine particles PM10 and PM2.5, nitrogen dioxide, CO2, ozones and the resulting short and long-term consequences for public health.

Assonautica, which brings together all professional and private boating interests in the lagoon, presented its vision, showing the attendees the huge variety of non-polluting (or less-polluting) vessels that are now operating, especially in Northern Europe and the USA: full electric or hybrid diesel-electric vessels, where the latter (when in thermal mode) use only fuels that guarantee minimal pollution and

no particles, such as methane, LPG or LNG.

Moderator Andrea Gusso, representing *Garanzia Civica*, raised the question of costs and benefits of transformation of the fleet. The abundant replies provided ample evidence of the positive cost-benefit ratio; although the initial investment is considerable, it is recovered within a few years thanks to the lower cost of the energy consumed and the reduced maintenance costs, even before considering the benefits for health of the operators, citizens and the monuments themselves, by reducing sulphation and marble plastering.

Stand at 1st Salone Nautico in June

After meeting in April with Gianni Darai, vice-president of Assonautica and Francesco Calzolaio, 'slow tourism' Lagunalonga creator and IWI's local representative, we welcomed the initiative of VeniceAgenda 2028, founded by electric boat historian and campaigner Kevin Desmond. A meeting was convened by our committee chair Hartmut Ginnow-Merkert, and a strategy was agreed. We then designed and produced banners presenting our core arguments for display on the Assonautica stand at the Arsenale on June 18-23. The stand attracted great interest

Among the inspirations for Venice is the groundbreaking ferry Ampere constructed for Norled by the Norwegian Shipyard Fjellstrand. The vessel operates the 5.7km crossing in the Sognefjord between the villages of Lavik and Oppedal. It makes approximately 34 trips a day, carrying up to 120 cars and 360 passengers. ▶



▶ One of the first electric taxis on the Grand Canal 'spinti dalla corrente elettrica' (propelled by the electric current)

▲ Electric dayboat for hire at Mazzorbo, one of a fleet owned by Classic Boats Venice, who offer 'the electric lagoon adventure.'

in Venice, among both politicians and the general public. See Kevin's report on p. 10.

All players are aware of the difficulties weighing on such investments in the current climate, particularly the problem of certification of new vessels that is well nigh impossible on account of obsolete regulations. These were drawn up before today's new propulsion systems were developed. Under the safety regulations still in force – seemingly dating back to antiquity – the electric motor can only be used as an auxiliary engine, an emergency engine and therefore only to back up an internal combustion engine.

Similarly, although LPG and LNG are now used in the automobile sector with all the necessary standards and controls, there is no provision for these fuels in the marine sector. These out-of-date regulations need to be completely overhauled at the national level, to avoid having to use foreign certification agencies.

Assonautica, VeniceAgenda 2028 and IWI declare:

It's time to clean the air in our lagoon... and to calm its waters!

- Support the campaign for clean fuels for all boats in the lagoon
- Make Venice Serenissima Again! An example for Europe, for the world
- Sign the petition 'electrify Venice' launched on change.org
- Make the transition from fossil fuel propulsion a win-win business prospect
- Support electric water taxi reliability trials in Arsenale and the lagoon in June 2020

See you here in 2020 to celebrate progress!

Wherever one looks, it seems, substantial progress is being made towards electric boat propulsion. The French Government has reduced the rate of VAT on green investments in the nautical sector, while Paris is planning for all passenger boats on the Seine to be electric by 2024, when the city hosts the summer Olympic Games.

In Norway the 'future of the fjords' is electric: the government plans to create the first zero-emissions zone on water after the parliament voted a resolution which would see carbon emissions banned in the World Heritage fjords 'as soon as technically possible and no later than 2026'.

The European Commission itself, both through its INTERREG programmes and its Horizon 2020 programme, has budgeted substantial amounts aimed precisely at reducing the emission of greenhouse gases as causes of global warming, sea level rise and dangerous and extreme climatic events.



▲ Assonautica Venezia's logo with the slogan 'I don't pollute'.

◀ Messages on the partners' roll-up banner displayed at the Salone Nautico in June.

Lady Betty, the 1894 English launch, restored and electrified by Classic Boats Venice in 2019 ▶



A passionate appeal to elected representatives for a 'Green Venice' was applauded wholeheartedly by the audience, convinced that their city – so unique in the world – should, for that very reason, become a symbol for an epochal change that is now clearly heralded by recent developments. It was also observed that the change will be to the credit of the politicians who are the first to succeed in achieving the transition, overcoming the many obstacles that are still strewn in the path of progress.

Mayor Luigi Brugnaro appears now to have rallied to the project, and recently expressed his satisfaction with the first municipal hybrid workboat on the Grand Canal 'It produces no noise pollution, being completely silent, nor atmospheric, and also reduces the wave motion,' he commented. For the first citizen of the Venetian capital this is clearly 'the future of Venice'.

■ GIANNI DARAI, ASSONAUTICA VENEZIA

* An electric *vaporetto* was tested as long ago as 1990.

E-Mobility on water the talk of the town (again)

EVER SINCE SCIENTIST Moritz von Jacobi presented the world's first useful electric motor to his sponsor Czar Nicholas in 1837, electric propulsion has been on the minds of those seeking a sustainable alternative to fossil fuels and other combustibles. Soon after that decisive event, in 1839, Jacobi demonstrated his electric boat on the Neva River, carrying an impressive count of 14 passengers upstream with its 15kW prototype electric motor and a set of galvanic batteries. Further R&D in electric motors, the development of rechargeable batteries and – much later – the practical implementation of photovoltaics allowed for a broad variety of electric boats and ships in the course of nearly two centuries.

Not just the early military submarines used combined (hybrid) propulsion systems consisting of an internal combustion engine (ICE), an electric generator and rechargeable batteries to power their electric motors. Nearly 100 years ago a fleet of 130 electric-powered Finow Standard Barges each capable of carrying 170 tons of cargo in its hold roamed the inland waterways of central and eastern Europe, some of them coming equipped with an auxiliary fossil-fuel powered 'range extender' (generator).

These days an overwhelming fleet of boats – from small craft to large ocean ferries and cargo ships – use electric propulsion. Technologies are shifting away from fossil to newer, cleaner technologies. Solar electric boats 'flying' at 50km/h on hydrofoils, electric tourist boats and ferries operating on lakes, rivers and canals, solar vessels circumnavigating our planet have demonstrated the feasibility of electric propulsion on water.

Recent developments initiated by Elon Musk and Tesla brought land-based e-mobility to the public's attention and purse. The rest of the industry is following suit. Thanks to Elon Musk's relentless pressure and Chinese research batteries have now come to a point where range and availability are no longer a motive for serious doubt. Cost and capacity of batteries have improved dramatically over the past few years, and so have photovoltaics. On-board photovoltaics on electric leisure craft is no longer a technological challenge, if ever it was. Components are still on the expensive side, however, as is the case with all new technology being manufactured initially on a small scale.

While batteries combined with on-board photovoltaic generators appear to be the most plausible implementation for recreational water-

craft on inland waterways, some applications confront engineers with power requirements that are beyond the viability of photovoltaics, and batteries may not be the first choice for energy storage. Many corporate and public research entities worldwide are actively pursuing venues to solve the mysteries of hydrogen. Hydrogen – of non-fossil origin of course and stored in liquid media without need of compression – might be a viable solution for water craft such as shuttles or cargo ships. Instances have been shown where hydrogen was produced from nothing but water, air and sunlight. Wouldn't that be the Philosopher's Stone of e-mobility?

While we wait for Elon Musk to produce affordable electric watercraft for our inland waterways, maybe the little steps are what take us towards a sustainable future. 'Electrify Venice', the campaign to bring electric boats to the Venice Lagoon, might become the tipping point for large-scale water-based developments paralleling the dramatic change from fossil-fuel to sustainable electric-powered land vehicles already taking place in different parts of the world.

Hartmut Ginnow-Merkert
IWI Alternative Fuels Subcommittee

E-Regata to promote clean energy boats in Venice lagoon



Venice Agenda 2028

www.veniceagenda2028.com

Why e-Regatas ?

The significance of an e-Regata is that very visibly it will test and demonstrate the qualities of electric boats: their zero emission, their low wash, their manoeuvrability, their autonomy and their relaxing silence.

As competition improves the breed, these qualities can only improve for the e-Regatas to come. This will also ease their acceptance and introduction not only in Venice but in other coastal towns and cities facing the challenge of rising sea levels, while the benefits in cleaner air of course apply equally to cities on rivers and canals.

Interested sponsor

IWI's committee has been approaching potential sponsors of next year's event, and considering the worldwide visibility of Venice, the buzz is already palpable. Interest in the positive publicity is heightened (albeit from a different angle) by the recent decision to ban the huge cruise ships that pompously and incongruously move along the Giudecca canal to the Tronchetto terminal. Venice can do it... for itself, and for the world! ■ KEVIN DESMOND

► Hybrid-electric prototypes for ACTV (left) and Alilaguna (right), moored in the Arsenal as part of the Salone Nautico, held for the first time in Venice KD

Cargo31, the electric workboat designed by Pietro Tosi for the Venice lagoon in 2019 ▼

ELECTRIC BOATS WERE MUCH IN EVIDENCE at the Salone Nautica di Venezia, held at the Arsenal on June 18-23.

The two waterbus companies, Alilaguna and ACTV, each displayed a hybrid-electric prototype able to handle the relentless 24/24 hour tourist demand. The latter has decided to build an initial batch of 35 of these during the next two years to replace their noisy-smoky-diesel versions.

Alongside Vizianello's HEPIC fuel-cell waterbus and their Nuvolari-designed 'retro-look' hybrid-electric water taxi, were three electric workboats also built locally by Veritas, Amadi and VeniceGoGreen's Cargo31 for the City's Chamber of Commerce. Also present were e-boats from Transfluid, solar-assist Nauma-Tec, X-Shore (Sweden) and Q-Yachts (Finland). The Italian Powerboat Racing Federation showed an uncompleted prototype of a Formula-E circuit raceboat. In this way, many thousands of Venetian and Italian visitors discovered the 'electric boat'.

Officially opening the event, Maria Elisabetta Alberti Casellati, President of the Italian Senate, then Venice Mayor Luigi Brugnaro, spoke about green sustainability for future generations and declared that all boats in Venice would have to become electric. The mayor had bought Ca'Farseti, the Transfluid hybrid electric wooden cabin runabout for the Municipality, stating 'soon there will be real possibilities to convert the boats and then we will think about the regulations with the various categories: to pass at certain times and in certain places, you must have the electric'.

Fuel-cell boats for Alilaguna ?

Both Alilaguna and ACTV, Venice's mass transit companies, exhibited prototypes at the show. ACTV plans to build 35 diesel-electric vaporetto in the coming two years, while Alilaguna is working on a fuel-cell version. The mayor expressed his conviction that all boats in the Grand Canal should 'go electric'.

The issue of replacing the many hundreds of privately-owned petrol outboard boats has still to be addressed.

E-regatas in Como and Venice

Also during the event, VeniceAgenda2028, in association with IWI and Assonautica Venezia, exposed their plan for a 'Zero Emission Lagoon Festival' for June 2020. This will include the four-discipline e-Regata (a Venetian word) and 'Noi Siamo Elettriche!' an electric boat procession along the Grand Canal.

Plans are expected to be finalised in November. Other parties expressed an interest in holding e-Regatas on Lake Annecy, Lakes Como and Bracciano in Italy and Lake Balaton (Hungary), making this an embryonic championship and new sport. (Brindisi, a maritime venue, is also interested.)

VeniceAgenda 2028 announced that the Foundation of Prince Albert II of Monaco had decided to support this project. Vela, representing the City of Venice, plans to hold two Electric Water Taxi e-Regatas, including a six-hour endurance trial, one on Lake Como and the other in the Arsenal during the 2020 event. Electric runabout manufacturers around the world will be sent the 2019 report.

