City Overview

Thinking the futures of Venice: what future for vulnerable coastal cities?

VENICE

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CITY OVERVIEW VENICE

City Overview

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Introduction

Thinking the futures of Venice: what future for vulnerable coastal cities?

"A city of water, an archetype of the imagination and a structure that meets fundamental anthropological needs." In 1974, Italo Calvino described Venice in these terms. *"I believe in the future of cities of water, in a world populated by countless Venices,"* he continued[1].

Venice's special relationship with water is based on a geographical, economic, and cultural reality that makes the presence of water in the city a condition of its existence. The lagoon, whose canals gave the city its "fish" shape, has for centuries been home to activities that take advantage of this relationship with the marine world (trade, shipbuilding, and fishing): an inextricable link between Venice and water symbolized by the marriage to the sea ceremony (*"sposalizio al mare"*). These elements document the construction of a city in harmony with its environment, whose 118 islands have gradually become specialized by function.

→ Gabriele Bella. *The doge's visit to San Nicolò after the Marriage with the Sea.* Circa 1779-1792. In the Pinacoteca Querini Stampalia, Venice.

However, water, once a protective element, is gradually becoming a threat to Venice. The disrupted relationship between the lagoon and its inhabitants, reflecting more broadly the disruption of the global climate, is endangering the city.

On July 31st 2023, UNESCO officially recommended that Venice be placed on the list of World Heritage in Danger. Faced with rising sea levels and hyper-tourism - phenomena that threaten many coastal areas on a global scale - Venice must deal with the concrete repercussions of these events on the city and its inhabitants. While frequent flooding threatens Venetian buildings, the waves of tourists increase the cost of living and housing and put a strain on traffic flow.

The near monopoly of tourism on the local economy means that other sectors of activity, particularly industry, are running out of steam. This decline feeds the Venetian city's historic fears of its own decay.

Since the dissolution of the Republic of Venice by its Great Council in 1797, the former city of the Doges has been struggling with a *de facto* economic and political weakening, which it has been trying to counteract in fits and starts over the last centuries.

In the past, Venice has cleverly kept itself afloat, but today it must deal with the global challenges of the Anthropocene[2] and reconcile the divergent perceptions of its stakeholders.

→ The Venetian lagoon in the industrial area of Porto Marghera

1 Calvino, Italo. *Venezia archetipo e utopia della città acquatica.* Milan : Arnoldo Mondadori Editore, 1995 (2nd ed.)

2 According to the CNRS: "The term 'Anthropocene' refers to the new geological epoch we have recently entered characterized by the unprecedented pressure that humans are putting on the Earth's ecosystem." https://www.inee.cnrs.fr/fr/lanthropocene

For Paolo Costa, its former mayor, there are two Venice: that of the tourists, the historic Venice, and that of the inhabitants, the metropolitan community of Venice. The two Venice refer to different economic, demographic and architectural realities. But the divisions don't stop there. Within the population itself, tensions arise between utilitarians and conservatists on the topic of the lagoon[3].

The interdependence of ecological, demographic and economic factors means that the current issues have to be considered as a whole. With this in mind, Venice is engaged in a delicate balancing act to carry out its objectives. To achieve this, the city strives to make adaptation its watchword, and in doing so, becomes the symbol of a constant quest for balance on an urban scale. La Fabrique de la Cité set out on the trail of this equilibrium during an urban expedition from June 4th to 6th 2025, accompanied by experts and decision-makers from a variety of backgrounds.

"Venice offers an extraordinary lesson on how, in the past, it was possible to combine competitiveness on an international scale with social and environmental protection."

Piero Bevilacqua,
Venezia e l'acqua:
una metafora planetaria, 1995.

[3] The former see the lagoon as a resource area from which the fruits must be extracted. The latter advocate lagoon conservation for itself, for the sole purpose that it exists and therefore, must be protected.

→ Panoramic view of Venice and its lagoon

Overview

A lagoon in recovery

The lagoon, a resource threatened by pollution

Originating nearly 6,000 years ago, the Venetian lagoon is Europe's second-largest wetland and **home to over 200,000 species**, including humans - whose presence here dates back over a millennium[4].

As early as the 5th century, the Lombard invasions drove people to seek refuge in this place[5]. The lagoon protected its inhabitants from enemies on land and sea, the depth of the water proving ideal for preventing horses from crossing and warships from maneuvering.

As Pierpaolo Campostrini, director of the Consortium for the Coordination of Research on the Venetian Lagoon (CORILA) recalls, the lagoon was historically conceived as a protective enclosure and acted as a defense wall. The city and the lagoon were two halves of a whole.

The particularly precarious conditions of existence induced by the topology of the place implied, very early on a form of cooperation with the ecosystem in order to meet the challenge of settling there.

In this respect, the *barene* play an essential role. Designating the parts of the marshes that lie outside the water, the *barene* are an essential part of the lagoon, performing fundamental ecosystemic and protective functions. As carbon sinks, they act as a buffer, slowing down the sea currents flowing towards the city, trapping sediment within their vegetation and complexifying the paths taken by water.

A place of refuge, the lagoon, expanse of water scattered with highly fertile soil, also supplies food for its inhabitants. It makes for a unique resource, both natural defense and source of sustenance[6].

"Venice is the lagoon. To understand its mechanisms and dynamics is to work with it."

Pierpaolo Campostrini,
director of CORILA.

[4] **Gatto, P. & Carbognin, L.** « La Lagune de Venise : l'évolution naturelle et les modifications humaines. » *Hydrological Sciences Bulletin*, Vol. 26, n°4, 1981, pp. 379-391.

[5] **UNESCO.** « Venise et sa lagune. » Consulted on August 20, 2025. https://whc.unesco.org/fr/list/394/

[6] **Solidoro, Cosimo, et al.** "Review of the Venice Lagoon as a coastal zone." *Coastal Lagoons: Critical Habitats of Environmental Change*, CRC Press, 2010, pp 1-24

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→ View of a field of *"castraure"*, the emblematic artichoke variety on the island of Sant'Erasmo in the heart of the lagoon.

The island of Sant'Erasmo provides a perfect example of this dual nature. The only islet in the lagoon made of sand, Sant'Erasmo performs the same protective function as the *barene*. It therefore acts as an important defense against the tides. Its nickname, "Garden of Venice", stems from its freshwater aquifer. Buried beneath its dunes, it renders a possible form of agriculture on a local scale. The interaction of its roots with the brackish water gives its artichokes and cherry trees, the island's flagship plants selected for their resistance to salinity, a distinctive taste. The preservation of the lagoon, a precious resource area, has been **a matter of survival and prosperity** for its inhabitants from the very beginning. Successive regulations on fishing (1173) and industry (1465) illustrate the importance attached to minimizing the pollution generated by the manufacture of glass, leather, dye and fur, and the concern for conserving the lagoon environment. The creation in 1501 of the *Magistrate alle Acque* (Magistracy of Waters) institutionalized the lagoon's place in Venetian political action and enshrined the desire for good governance based on a balanced form of arbitration[7].

Now a UNESCO World Heritage Site, the lagoon suffered from a relaxation of industrial pollution regulations in the 20th century. Petrochemical production in Marghera released large quantities of heavy metals (arsenic, lead, mercury) and eternal pollutants (dioxins, phosphate). It also required the digging of deep canals for the crossing of oil tankers. The most emblematic example is the Malamocco-Marghera Canal (100 m wide, 12 m high). These operations are responsible for a 20% loss of biodiversity in the lagoon[8].

→ *Barene* close to San Francesco Island, Venice lagoon

[7] Ibid

[8] **De Thier, Frédéric.** « Impacts et menaces portant sur un site patrimonial à haute fréquentation touristique. Le cas de Venise. » Mémoire. Master's thesis in Environmental Sciences and Management. The Université libre de Bruxelles. 2017. Page 44

A theater of conflicting uses and representations

Lagoon ecosystems have a limited lifespan. **Eventually, the lagoon is destined to either become a piece of continent or a marine bay**. The Republic's preservation of Venice's lagoon-like state therefore constitutes an artificial prolongation of its existence. A precarious stability is thus maintained between sediment filling and aquatic invasion.

This ongoing struggle reflects itself in Venetian representations. Bernardo Trevisan, in the frontispiece to his work *Della Laguna di Venezia* (1715), offers a fine example. The confrontation between the allegories of the Earth and the Sea expresses the force and instability of the movements that the city must accommodate[9].

→ Bernardo Trevisan, *Della Laguna di Venezia*, 1715.

In the 16th century, the Magistracy of Waters had to find a solution to the problem of the lagoon's sediment filling. The diverting of major rivers – Brenta (1339), Po (1604) and Sile (1683) – supposed to provide a solution to the problem, saw its effectiveness diminished by the deforestation of the banks resulting from the construction needs of the city and its ships.

This preoccupation persisted until the 18th century and only changed with the global rise in sea level. Water took over, and sedimentation, far from being a repellent phenomenon, became increasingly sought-after.

> ***"The long history of change has made Venice and its lagoon an artificial system."***
>
> ***Luca Zaggia,***
> *geologist and oceanographer at Venice's Institute of Geosciences and Geo-Resources.*

In parallel with these upheavals, Venetians have been pondering the fate and functions of the lagoon over centuries. Their visions were often contradictory. Two opposing camps gradually emerged, embodied at different times by different figures who built and fueled the existence of a debate on the lagoon.

In the 1550s, Cristoforo Sabbadino, a member of the Magistracy of Waters, and Alvise Cornaro, a hydraulic engineer and Venetian patrician[10], were already divided on the issue. The former advocated the preservation of a lagoon "body" in its entirety, likening the functioning of the lagoon to that of the human metabolism, in which each part is essential to the proper functioning of the whole. The second was in favor of reclaiming part of the lagoon for agricultural production, the lagoon remaining an economic tool to be put at the service of the city and its inhabitants.

The quarrel continued into the following century. In 1664, Nicolò Sagredo, Doge of Venice, favored a clear separation between "living" and "dead" lagoons, to increase the surface area of cultivable land. Federico Contarini, a politician from an influential family, was in favor of a discontinuous dike leaving the lagoon open to the sea to maintain trade. Opposition over the lagoon's uses and development policies thus reflected the natural fluctuations of a space torn between land and sea[11].

The dispute persists in modern times. The construction of the port of Marghera required extensive reclamation, and the industrial and economic revival of the Veneto region, symbolized by Marghera, was similarly accompanied by a great leap forward in land recovery. The creation of an area dedicated to fish farming, the "*Valli da Pesca*", in the 1940s followed by the establishment of Venice International Airport in the 1950s continued the encroachment on the lagoon.

These decisions are now being challenged. Their ecological impact is considerable: the **erosion of *barene***, already endangered by the reclamation initiatives of the 20th century, is accelerated by the multiplication of marine storms, the densification of tides linked to global warming and the passage of ships. In the early 2000s, estimates point to a significant reduction in their surface area. From the 255 km² counted in the 17th century, only 47 km² were left in 2003, with a reduction of almost 70% between 1800 and 1992[12].

> ***"Saving the lagoon means engaging in daily reflection on what we can improve on a small or even a very small scale, to make it habitable for longer."***
>
> ***Paola Viganò,***
> *architect and urban planner, full professor at IUAV and EPFL (Lausanne).*

→ Panorama of the *barene* north of the lagoon, near the village of Lio Piccolo

9 **Grillo, Susanna.** "L'équilibre de la lagune de Venise au XVIIe siècle : naissance de l'approche moderne." *Eau et développement dans l'Europe moderne*, Éditions de la Maison des sciences de l'homme, pp. 169–182.

10 According to the CNRTL: "From the Middle Ages to the end of the 18th century, a group of families, often noble or ennobled, who held wealth and power in a number of urban Republics, particularly in Italy."

11 **Grillo, Susanna.** "L'équilibre de la lagune de Venise au XVIIe siècle : naissance de l'approche moderne." *Eau et développement dans l'Europe moderne*, Éditions de la Maison des sciences de l'homme, pp. 169–182.

12 **Gatto, P. & Carbognin, L.** « La Lagune de Venise : l'évolution naturelle et les modifications humaines. » *Hydrological Sciences Bulletin*, Vol. 26, n°4, 1981, pp. 379-391.

Anticipating and safeguarding the lagoon

In view of this situation, several solutions have been proposed. Restoring the barene, a delicate operation carried out by engineers, requires calculating the elevation of the benches to the nearest millimeter to ensure the development of vegetation and their activation as an ecosystem.

The reintroduction of river and marine sediments is also considered. Formerly diverted rivers could be welcomed back into the lagoon. Their floods would feed the lagoon with sediment, which until now has been held back by structures in high mountains that protect the area from flooding and landslides. However, river sediment alone would not be enough. Every 2 millimeters that the lagoon loses must be compensated for by 1 million cubic meters of sediment-laden water. To stabilize the equation, marine sediments, which are more abundant than river sediments, could provide reinforcement, but would require the dismantling of the dikes located at the mouths of the lagoon to be accomplished. Not to mention that a balance between river and marine sediments has yet to be found.

For Paola Viganò, urban planner and professor at EPFL Lausanne and IUAV University, there are three possible scenarios for the lagoon's future. In the first, the lagoon would be divided into three parts. The northern and southern parts would be closed to large ship traffic and would remain lagoons; the central part, on the other hand, would be delimited to preserve accessibility to the port of Marghera and would become a marine bay. In the second scenario, the lagoon would be permanently closed to the sea by a barrier that would transform the area into a lake to counter the threat of the waters. Finally, in the last scenario, the *Modulo Sperimentale Elettromecchanico* (MoSE) would give engineers, scientists and decision-makers the time they need to develop a satisfactory solution for saving the lagoon.

Created by the 1973 Special Law which declared the protection of Venice to be of **"priority national interest"**, the MoSE is a complex of 78 mobile dikes, which came into operation in 2020 after 17 years of work[13]. Located at the three mouths of the lagoon, the MoSE comprises some twenty barriers at each location, ranging in size from 15 to 22 meters. Its aim is to mitigate the risk of flooding induced by the increasing height of the *acque alte* in the city.

Preserving life in the lagoon, i.e. protecting and extending its habitability for as many species as possible, remains a central element in each of the scenarios. The lagoon is, and must remain, an inhabited space.

"The lagoon itself is not very fragile. On the contrary, you could even say it's resilient. It is rather the human presence in the lagoon that is fragile."

Pierpaolo Campostrini,
director of CORILA.

[13] **Vodisek, David.** « Ville et développement durable. Venise, un cas exceptionnel. » *Population & Avenir*, Vol. 712, 2013, pp. 4-9.

Giancarlo de Carlo at Mazzorbo

Between 1979 and 1985, Genovese architect Giancarlo de Carlo undertook an ambitious project on Mazzorbo, an island north of the lagoon: to build social housing and public facilities (sports campuses, schools, nurseries, gardens) to provide better living conditions for the disadvantaged inhabitants of the neighboring island of Burano. The study period introduced a participatory process with residents to understand their expectations and co-construct a neighborhood where they would like to live. In addition, the architect conducted an extensive observation of Burano to ensure that his complex on Mazzorbo would blend harmoniously into the characteristic architectural landscape of the northern lagoon.

The viewpoint of... Patrice Duny

Director, Caen Normandy Metropolis Urban Planning Agency, AUCAME

On Venetian optimism and MoSE

"Venice seems to have been born and lived under the sign of constraint and permanent adaptation to a changing context and environment.

I was very impressed by the great pragmatism and optimism of the Venetians, which is a real value to bear; by their attachment to the lagoon and the way of life it has generated. Beyond that, temporality also seems important to me. "With MOSE, we can rest easy for 75 years ... it gives us time to think" (Paola Viganò) and find solutions. And all the while, life goes on.

In our territories, we need to move towards with this philosophy: protect quickly and perhaps temporarily what deserves to be protected and take the time to prepare for the next phase of adaptation. From now on, adaptation will have to be permanent. And rather than a constraint, it should be seen, as in Venice, as a vital force."

Living in Venice with rising sea levels and hyper-tourism

Adapting to flooding to preserve habitability

Venice is experiencing **an unprecedented demographic decline** in its history. Whereas the island part of the city still had 175,000 residents in the mid-twentieth century, there were only 67,000 in 2016 and 48,500 on January 1st 2025[14]. At the same time, the city subsided by 10 centimeters between the 1950s and the 1970s[15].

Marine transgression and subsidence, phenomena worsened by human activity, are at the root of sinking and flooding in Venice. Defined by Luca Zaggia, geologist and oceanologist at the Institute of geosciences and geo-resources, as "a natural compaction of the soil that occurs in every coastal region, delta or estuary", subsidence in Venice was accelerated by the groundwater pumping required to cool factories in Marghera - which reached almost 1.5 million liters of water per day in 1969.

To access the groundwater table, it was necessary to break through the layer of sand at the bottom of the lagoon, thereby reducing the pressure contained in the soil layers. As the clay underneath met the sand, it shrank, causing subsidence. **Venice has thus lost 27 centimeters in one century**.

Added to this are the consequences of global ecological upheavals. Could Venetians count among the climate refugees? The question was asked on November 12th 2019, following the destruction caused by the exceptionally high *acqua alta** which flooded almost 80 % of the city.

→ *Acqua alta*, November 12, 2019, Fondamenta dei Penini

Acqua alta :
Temporary flooding of the city caused by a combination of high tides during the equinoxes, low pressure over the Adriatic Sea, strong Sirocco or Bora winds, and river overflows due to heavy rainfall. A phenomenon that occurs frequently in autumn and spring, its impact has been significantly reduced since the MoSE system became operational.

[14] **Pakiry, Quentin.** « Venise et la gestion du tourisme de masse. » *Institut Sapiens*, 4 décembre 2023. Consulted on August 20, 2025. https://www.institutsapiens.fr/observatoire/venise-et-la-gestion-du-tourisme-de-masse/

[15] **Gatto, P. & Carbognin, L.** « La Lagune de Venise : l'évolution naturelle et les modifications humaines. » *Hydrological Sciences Bulletin*, Vol. 26, n°4, 1981, pp. 379-391

Once essential to maintain good hygiene in the city by renewing the water in the canals to limit disease and pests - foremost among them malaria and mosquitoes - *acque alte* have become increasingly frequent and extreme since the 1960s, **calling into question Venice's habitability**.

Recurrent flooding is undermining the centuries-old UNESCO World Heritage site. Rising sea levels threaten the brick walls which are ill-prepared to withstand the repeated assaults of salty water[16]. The walls are built on Istrian marble, a particularly resistant material, but are now entirely submerged. In historic buildings such as St. Mark's Basilica, the crystallization of salt on the 10,598 m² of mosaics following the floods of 2019 broke the plaster and caused the tiles to fall, damaging works that are over a thousand years old.

"In the modesty of this small barrier [of glass around St. Mark's Basilica] facing the MoSE, we have the two extremes of the solutions that Venice hybridizes to manage to adapt and save itself."

Étienne Achille,
inspector General, Senior Digital Official at the French Ministry of Agriculture.

[16] **De Thier, Frédéric.** « Impacts et menaces portant sur un site patrimonial à haute fréquentation touristique. Le cas de Venise. » Mémoire. Master's thesis in Environmental Sciences and Management. The Université libre de Bruxelles. 2017. 93 pages.

A wide range of responses

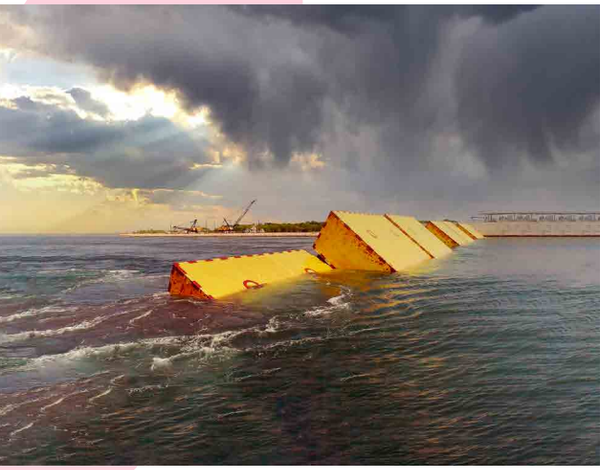
Venice is adapting. At various scales, initiatives are being undertaken to counteract the slow destruction of urban fabric. Quays, sidewalks and bridges have been continually raised since the 18th century to adapt to rising water levels but will soon reach their limits, in terms of architectural harmony and practicability. Mobile footbridges are installed during high tide, first floors change their use.

In 2022, in the vicinity of St. Mark's Basilica, the municipality installed glass barriers connected to a pumping system, to protect the religious building from flooding up to 1.95 m above sea level. As a temporary device that leaves the building visible to walkers, it will be dismantled once the insula marciana (core of the old city) has been permanently waterproofed[17].

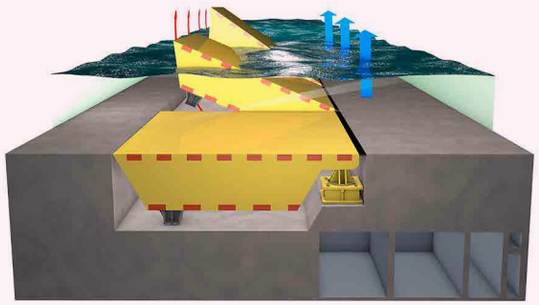
In the past, other, larger-scale projects had also been promoted, only to be abandoned. In the early 2000s, the idea of raising the city's water level by injecting seawater into an underground geological pocket at a depth of 800 meters was widely publicized. This technique, which has been used since the 1950s in the United States using processes derived from the oil industry, would raise the level of Venice by around 25 centimeters, reducing by 90% the risk of *acque alte* surpassing 1.10m. Nonetheless, the project presents a major risk: a heterogeneous rise in the city's level, leading to differences between neighborhoods and the resulting deformation of the urban structure[18].

[17] **The Guardian.** "Glass barriers keep St Mark's Basilica dry during Venice floods." December 22, 2022. Consulted on July 15, 2025. https://www.theguardian.com/world/2022/dec/22/glass-barriers-keep-st-marks-basilica-dry-venice-floods

[18] **Comerlati, Andrea. Ferronato, Massimiliano. Gambolati, Giuseppe. Putti, Mario & Teatini, Pietro.** "Saving Venice by Seawater." *Journal of Geophysical Research.* 2004, Vol. 109, n°3, pp. 1-14.



→ The MoSE system.



→ Functional schematic

To prevent flooding, the MoSE remains the most important project to date - and the most debated. Its colossal works required the creation in 2004 of an artificial island, the Isola Nuova, to join two canals of differing depths in the mouth of the Lido. The project, which costs 35 million euros a year to maintain, has proved its worth in the face of the *acque alte*.

When an official order is issued by the municipality, groups of engineers located at the three mouths manually lift the gates using a pneumatic compressed-air system. Only 30 minutes are needed to lift all the gates. These gates are not completely watertight: a few cubic meters continue to pass through every second, maintaining a slight interaction with the waters of the lagoon. On the other hand, they are designed to withstand the immense force of the current that flows through each gate during a storm, amounting to some 20,000 cubic meters per second.

Nevertheless, the long-term effectiveness and consequences of the MoSE on the lagoon ecosystem remain debated. **Conceived in the 1970s, the project was designed to cope with high tides based on the one from 1966**, whose intensity and duration differ from those of today.

The slight permeability of each barrier, which wasn't a problem at the time, is now an issue. Originally intended to be activated just before the peak of the *acqua alta*, the MoSE must now be kept constantly closed as the peaks multiply and draw closer together. What's more, the sea level can remain above 1.10 m between two peaks, **leading to a slow but steady rise in the water level inside the lagoon**. In 2020, for example, the MoSE remained in operation for four days. Meanwhile, the internal level of the lagoon was raised by almost 20 centimeters. The water level, having reached 90 cm, Piazza San Marco was flooded, illustrating the project's weaknesses.

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According to Andrea Rinaldo, winner of the Stockholm Prize for Water 2023, the MoSE, which has already been activated almost 120 times, could be shut down up to 260 times a year by 2050 as a result of global warming. The most pessimistic scenario would see the MoSE raised eleven and a half months a year, causing colossal damage to the lagoon ecosystem. To extend the project's lifespan, its engineers are currently experimenting with different closure configurations.

→ Isola Nuova is the piece of land between the two breakwaters at the mouth of the Lido

"You have to differentiate between resistance and resilience. The MoSE is an example of resistance to water. Resilience is more about partial acceptance of the phenomenon, i.e. coexistence with water."

Paola Viganò,
architect and urban planner,
full professor at IUAV and EPFL (Lausanne).

The viewpoint of... Thomas Beillouin

Architect-Urban Planner, expert in territorial resilience, Artelia

On adaptation in Venice

*"As an architect and urban planner specializing in territorial resilience, I work with territories vulnerable to natural hazards, and of course climate change, on a daily basis. I believe that **the protean innovations deployed in Venice can be a source of inspiration**, whether by daring to implement original technical devices or by constructing new territorial narratives.*

*Territorial resilience to climate change requires **strong, consistent and long-term action, both in terms of adaptation and mitigation**. The efforts required are considerable and multi-dimensional: a major effort on studies, a probable redirection of existing budgets towards this effort, the implementation of planning tools enabling us to reconcile maintaining a long-term course with flexibility in the face of uncertainties or unforeseen events, etc. Resources, expertise, governance... All the conditions must be in place."*

Venice, a historic destination threatened by deterioration

Venice's appeal as a tourist destination is a long-standing - and calculated - phenomenon. **Since the Middle Ages, the city of the Doges has intelligently and consciously curated its spaces to attract visitors**, carefully cultivating its myth and image. Tourism is a historical and political object, which has been and continues to be developed in the city[19].

In medieval times, for example, Venice specially chartered galleys for the thousands of pilgrims wishing to sail towards Jerusalem. In the 18th century, it transformed itself to make itself more attractive to travelers: the carnival that made it famous throughout Europe lasted six months, and music was played every evening. In the 19th century, despite its political turmoil and the decline with which it was gradually associated, the city remained a favorite of the Romantics, as a last refuge in the face of the thundering advance of industrialization. In the 20th century, the momentum continues, with a million visitors in the early 1950s. The city now welcomes 20 to 30 million tourists every year[20].

→ St. Mark's Square and the Doge's Palace with, in the background, an imposing cruise ship in Venice, 2018

Venice is a favorite stop for Mediterranean cruises. **Until 2021**, the huge liners of the major cruise lines docked right in the historic center, pouring thousands of visitors onto the quays every day. The movement of these huge liners posed major material, health and environmental risks.

In addition to serious accidents, such as risk of grounding (San Marco's Basin, 2004) or collision with the quays (Giudecca, 2019), cruise ships were particularly harmful in terms of air pollution. In July 2023, a report by the Transport & Environnement association ranked Italy as the European country most affected by this pollution, with ships responsible for high emissions of nitrogen oxides (SOx, NOx) and fine particles (PM 2.5). That same year, a French Senate report estimated that a cruise liner consumed 500 to 2,000 liters of fuel per hour, and discharged as much pollution in one hour of docking as 30,000 vehicles traveling at 30 km/h: this, for the sole purpose of ensuring the continuity of on-board services[21].

In addition, the backwash from passing liners was responsible for miniature tsunamis and exerted considerable pressure on the city's foundations, which consisted of wooden piles planted in the *caranto*[22], weakening the structure of the underpinnings. Each passage could cause erosion of the lagoon soil extending a kilometer beyond the canals and loosening large volumes of sediment - between 1,000 and 2,000 mg per liter, a rate more concentrated than the volumes suspended during a marine storm.

19 **Garrigou-Lagrange, Matthieu. Prévost, Anne-Vanessa & Nadjar, Vanessa.** « Plongée dans la carte de Venise. » *Géographie à la carte*, France Culture, September 8, 2022. Consulted on May 8, 2025. https://www.radiofrance.fr/franceculture/podcasts/geographie-a-la-carte/plongee-dans-la-carte-de-venise-7590604

20 Ibid

21 **Transport & Environnement.** "Navi da crociera. L'Italia è il Paese dove inquinano di più, al primo posto in UE." June 15, 2023. Consulted on April 22, 2025. https://www.transportenvironment.org/te-italia/articles/navi-da-crociera-litalia-e-il-paese-dove-inquinano-di-piu-al-primo-posto-in-ue

22 From the Latin *"caris"*, stone. A layer of compacted clay, sand, and silt in the Venetian lagoon forms a stable soil suitable for construction.

23 **Pakiry, Quentin.** « Venise et la gestion du tourisme de masse. » *Institut Sapiens*, December 4, 2023. Consulted on August 20, 2025. https://www.institutsapiens.fr/observatoire/venise-et-la-gestion-du-tourisme-de-masse/

24 **Beatley, Timothy (ed.).** *Green Cities of Europe*. Washington D.C: Island Press. 2012. 244 pages.

The challenges of tourism regulation: limiting destructive effects and avoiding the "museum city" trap

Apart from the dangers posed to the urban fabric, the presence of tourists also has consequences for the social fabric of Venice. Hyper-tourism is a major contributor to demographic decline. **The tourism monoculture affects all aspects of urban management**, from waste treatment (83 % of which is generated by tourists) to the slow transformation of the city into a place devoid of services, to the benefit of businesses entirely dedicated to tourism[23].

The omnipresence of tourism also accentuates inequalities and contributes to the social fracturing of the city. A former center of power, the political and economic heart of Venice, home to the Doge's Palace, the Senate, the Commercial Magistracy and the Customs House, the San Marco district is today one of the areas most affected by gentrification and the disappearance of the residential and economic fabric, according to Alessandra Marcon, researcher and professor at the IUAV and Gustave Eiffel University.

In addition to this economic gentrification, there is also a gradual "climatic gentrification", with the departure of the most disadvantaged populations, unable to afford the reconstruction costs associated with the floods and therefore unable to continue living in the city. The loss of social diversity in certain neighborhoods is detrimental to a city that is already struggling to **link its island populations economically and sociologically with those on the mainland**[24].

How do you create solidarity, maintain a social bond, "make community" when, in the words of Paolo Costa, former mayor of Venice, "the Venetians of the lagoon and the Venetians of the mainland have absolutely nothing in common in sociological terms"? And what's more, when the **different parts of the city depend on different core businesses?**

"The historic center can live very well economically without needing the other parts of the city; but it counts only 45,000 inhabitants out of a metropolitan community of almost 600,000 spread over 16 different municipalities. Fundamentally, then, it must be possible to connect this community, so that people who sleep in Mestre and work in Venice and vice versa, don't feel like they belong in two different worlds.", Paolo Costa.

At provincial level, the territorial plans attempt to strike a balance between the need to preserve the city and its environment and the objectives of economic (re)development. As early as 1996, the Venice Master Plan aimed to reconcile island and mainland cities, while emphasizing historical identity and the need to preserve the environment. A work still in progress.

The viewpoint of... Marjolaine Meynier-Millefert

President, Alliance HQE-GBC

Venice, city-network and democratic matrix?

"In the course of our discussions, a question gradually crossed my mind: what if this city, so special in European history, illustrated the structuring effects of weak networks on innovation, including political innovation?

This network is not an abstraction: it is the canals themselves - real connecting arteries - that organize and structure traffic. Inter-island exchanges are facilitated, ritualized and made necessary by the very geography of the lagoon and its network of canals.

Crossing these descriptions with Mark Granovetter's theories on the strength of weak ties (1973) and the embedding of social structures (1985), several analogies came to mind. Granovetter showed that in complex societies, strong ties (family, closed communities) ensure local cohesion, but tend to produce compartmentalization; weak ties (inter-group exchanges, transversal interactions) are essential to the circulation of information and social innovation.

The former are a source of trust, the latter a lever for innovation. This double network may have fostered a fertile breeding ground for innovation and research, and perhaps a political culture more oriented towards ***compromise, shared deliberation and adaptability*** *- all traits that mark the Venetian institutional model."*

Faced with this situation, and in the wake of the COVID-19 pandemic, tourism is increasingly regulated in Venice. On August 1st 2021, the municipality banned the passage of ships over 25,000 tons. In April 2024, an entrance tax was introduced for daily visitors not staying overnight during the 29 busiest days of the year. From € 5, the tax was raised to € 10 without prior reservation in 2025 and extended to the 54 busiest days of the year. This entry tax complements an initial tourist tax introduced in 2011[25].

In addition, certain tourist sites which are particularly popular during Carnival, such as the Basilica and Piazza San Marco, are limiting the number of visitors. Other restored monuments are being reopened **with a dual use in mind for both locals and tourists**. Such is the case of the *Procuratie Vecchie*, the architectural complex surrounding San Marco Square, emblem of Venetian power and seat of the Republic's procurators, closed to the public for 500 years. Its mysterious character is destined to attract visitors, but the renovation of the site is not only about tourism. In fact, since their reopening, the Old Procuraties have been home to The Human Safety Net Foundation, owned by the Generali insurance group. They include a floor dedicated to coworking, free to Venetians, and host local businesses, cultural institutions and other foundations.

"We need a path of evolution so that this community, which carries this enormous heritage on its shoulders, doesn't become its slave."

Paolo Costa,
former mayor of Venice and former president of the port.

→ *Procuratie Vecchie,* St. Mark's Square

[25] **Le Monde.** « À Venise, la ville étend sa taxe d'entrée pour lutter contre le surtourisme. » February 11, 2025. Consulted on April 23, 2025. https://www.lemonde.fr/international/article/2025/02/10/a-venise-la-ville-etend-sa-taxe-d-entree-pour-lutter-contre-le-surtourisme_6540684_3210.html

The port, from abandonment to restructuring

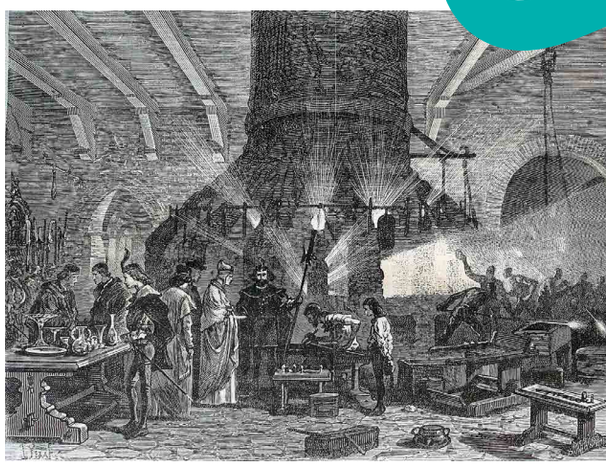
From apogee to deindustrialization: the evolution of the port of Venice, the city's historic economic heartland

In medieval times, the golden age of Venice, the port was the beating heart of economic activity and innovation. Around 1400, 36,000 of Venice's 150,000 inhabitants had found work in the port, including 2,000 in the Arsenale.

Founded in the 12th century, the Arsenale brought together a close-knit community of master shipwrights, sailors and shipowners. A sort of city within a city, separated from the rest of the population, the Arsenale defended its sought-after techniques from prying eyes. When it came to shipbuilding, it was indeed the most efficient naval factory in Europe – and the world. It was the only place where it was possible to assemble all the parts of a ship and arm it in a single day – a feat, considering that the largest European arsenals were only capable of doing so in several months. The Arsenale was also used to store gunpowder until 1562, when an explosion heard as far away as Vicenza (some 60 km) put an end to this use. The gunpowder reserves were then distributed to other islands – Sant'Erasmo and Madonna del Monte.

During the Renaissance, Venice was not only the flagship of the naval industry. It was also the capital of glass. Since 1291, when the Republic decided to move its glassworks there in order to keep the processes secret, the Murano archipelago had been a closed factory-town with privileges granted to master glassmakers. In the 16th century, Venetian craftsmen created one new product after another: crystalline glass, filigree, *retortoli* and *reticello* techniques, imitation stones, pearls and mirrors... Glass was joined by other innovations: prints, silk, soap... The telescope invented by Galileo also saw the light of day in Venice, as did copyright designed by Aldo Manuzio, also the father of italic.

→ Francesco Guardi. *Venezia: L'Arsenale.* Circa 1755-1760, in the National Gallery, London



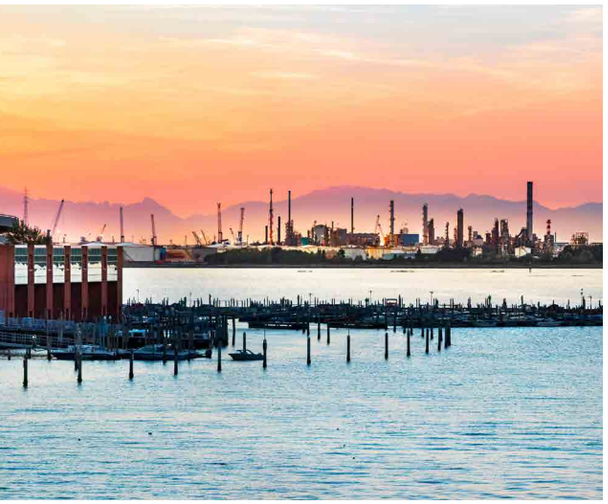
→ François Dumont. *The Doge of Venice visiting the Murano glassworks.* Engraving from Louis Figuier's *Les merveilles de l'industrie (Tome I),* 1873-1877.

Europe's leading industrial center during the Renaissance, Venice went into decline in the 17th and 18th centuries, before regaining some health at the end of the 19th century thanks to its manufacturing industry. In the second half of the century, Giudecca was transformed into a production site, with mills, leather and textile workshops, rope factories and chemical plants. In 1917, the Giudecca factories gave way to the Marghera industrial-port complex.

Situated on the mainland, Marghera represents the culmination of a relocation movement towards the periphery, aided by the construction of the Liberty Bridge linking Venice to the mainland (1846), followed by the completion of the Milan-Venice railroad line (1860).

At the end of World War I, the city was looking for a new area of industrial expansion to extend its hinterland and multiply its outlets; an area not constrained by the geographical limits of the historic center, as the old port had been. In its early years, the port of Marghera embodied an opportunity for economic and industrial renewal for the entire Adriatic coast. The "Greater Venice" project of which it was a part - inseparable from the first vigorous impulses of fascism in the region - testified to a strong desire for modernization and a break with the ruin of the previous century.

A major center of activity for almost fifty years, the port was organized around key plants such as Petrolchimico (1951), Edison and ENI, and at its peak, in 1965, employed almost 40,000 workers. However, the site did not escape the trend towards deindustrialization. In 1971, the first factory closed its doors. At the same time, protests about the poor management of petrochemical production were growing, denouncing the consequences for the environment and workers' health.



→ View of the industrial area of Porto Marghera

"The city's history is marked by a significant evolution from an era of maritime dominance to one marked by a return to the mainland. The industrial-port complex of Marghera is a recent witness to this reversal, showing that on the scale of the lagoon, the city has in fact never ceased to evolve."

Thomas Beillouin,
architect and urban planner, specialist in territorial resilience at Artelia.

A series of strikes took place, paralyzing the port. In particular, the strikers denounced the content of the municipal master plan adopted ten years earlier, in 1963, which authorized petrochemical plants to spread noxious fumes. At the same time, at national level, accidents and poisoning were multiplying: the "Italian Chernobyl" at Seveso in 1976, a fatal explosion at the Brindisi petrochemical plant in 1977... The oil crises of 1973 and 1979 further called into question the future of the industrial port zone, which was centered on petrochemical production[26].

The political decline of the 19th century was followed by industrial decline at the end of the 20th century. Between 1991 and 1995, Marghera's largest plants closed down. Of 30,000 workers in 1975, the port had only 18,000 by 1990. At the same time, the number of employees enrolled in the Extraordinary Compensation Fund, set up by the Italian government to compensate for the reduction in working hours among factory workers, increased exponentially. In 1998, the Italian government declared the site to be "highly polluted and in need of rehabilitation", a long-awaited conclusion for a run-down industrial zone confirmed to be in "severe industrial crisis" in 2010.

An area in transition...

The port continues to operate, however. Since 2017, it has housed the offices of the North Adriatic Sea Port System Authority (ADSPMAS), a non-profit public entity with a special regime responsible for managing the ports of Venice and Chioggia. Financially autonomous, ADPSMAS secures its revenues through the concession of certain parts of the port of Marghera to private operators. It is responsible for controlling activities developed by the private sector (services, transport and logistics, trade, construction), guaranteeing the transparency of competitive bidding procedures, and coordinating the authorities operating within the port - customs, border police, emergency services.

The port's economic recovery owes much to the initiatives of the few industrial giants that have remained loyal to Marghera, such as Fincantieri - which, it should be noted, dedicates its Venetian site to the manufacture of cruise liners.

Marghera's future holds many opportunities. First and foremost, the Port of Venice could become an essential link in the logistics chain connecting Europe and Asia. It has a number of advantages in this respect: vast areas that can be reconverted, a mobility hub (freeways, railroads, airport), simplified administrative processes for investment... The availability of space and the speed with which authorizations have been granted recently led Volkswagen, for example, to make Venice its hub between Bavaria and the Asian market.

By 2050, Marghera could also be transformed into an energy port - the 2050 Net Zero Energy Hub, part of Europe's climate strategy to achieve net zero emissions by 2050 - thanks to its proximity to major European energy networks, including the trans-Austrian gas pipeline.

[26] **Zazzara, Gilda., et al.** « La disparition de l'Italie industrielle : Porto Marghera en Vénétie ». 20 & 21. *Revue d'histoire*, Vol. 144, n°4, 2019. pp.146-160

ACTV and green mobility

Azienda Consortio Trasporti Veneziano (ACTV) is the public transport company of the Municipality of Venice. Carrying almost 148 million passengers over 500,000 hours of navigation per year, the 2,700-employee company began looking into the electrification of its *vaporetti* fleet in 2008, in order to limit the impact of its journeys on the lagoon's ecosystem.

In partnership with the University of Venice, ACTV carried out calculations estimating the pollution levels emitted by its fleet, as a starting point for the search towards more ecological options. In the end, it opted for hydrogen-powered engines, whose interchangeable propulsion system facilitates the future transition to all-electricity – a choice still unthinkable today, given the impossibility of building a sufficient number of recharging stations in a city with a protected architectural heritage. Since 2020, ACTV has been working with Vulkan, a German multinational, to upgrade its current engine to a version better suited to *vaporetti* maneuvering.

However, the transition of public mobility in Venice faces a number of challenges. The high cost of purchasing and maintaining the vessels, as well as that of the personnel on board, is compounded by the ecological impact of building these vessels, which are made of carbon fiber, a non-biodegradable material with a particularly energy-intensive manufacturing process.

→ ACTV *vaporetto* docking at "Cimitero" stop, San Michele Island

...facing a myriad of challenges

These prospects, however, should not obscure the difficulties the port still faces—particularly geopolitical ones. The recent unrest in the Suez Canal has lengthened the routes between Asia and Europe, forcing ships to now bypass the Mediterranean instead of transiting through it. Venice's very close trade relations with Ukraine in wheat and steel have similarly been undermined by the war that has been raging there since 2022.

The port is also facing fluctuations in governance at the national level. A legislative reform initiated in 2016 to streamline and concentrate strategic planning in Rome for Italy's 24 port authorities ended in partial failure. The issue of governance is at the heart of concern at the port level. Questions surrounding the possible unification of the five ports on the Adriatic coast, in response to the structural inefficiency of each of them, underpin the debates on the prospects for Marghera. Ravenna, Trieste, Venice, Koper, and Rijeka could thus be united into a single authority, a transnational project similar to the work carried out in the early 2000s between Sweden and Denmark to connect the countries via the Øresund Strait. On the Italian side, however, this proposed merger faces strong opposition from the regions, which maintain close ties with the port authorities and reject the delegation.

Finally, the preservation of the lagoon remains an essential question to ask when considering visions for the port. Dredging the canals, essential to ensuring safe navigation for ships, has serious consequences for the lagoon bed. Since the "Channeling" project carried out in partnership with the European Commission, aimed at estimating the extent to which it would still be possible to dredge the Malamocco-Marghera Canal, massive dredging of the seabed has been abandoned in favor of sediment cleaning limited to accumulations that pose a risk to navigation.

Initially intended to provide access to the Port of Marghera, the MoSE now represents the main obstacle to the port's redevelopment. In fact, the port is inaccessible when the barriers are removed. This problem could, however, be resolved by the establishment of a permanent access structure that would restore the port's independence, the Venice Offshore – Onshore Port System (VOOPS), whose ecosystem impact on the lagoon remains to be assessed.

The point of view... Élise Couturier

Deputy Director, GIP Littoral Nouvelle-Aquitaine

On Venetian governance methods

"At the end of the stay, when we have a more comprehensive view of the issues and interests of each party, it is ultimately the process of organizing decision-making that emerges as probably the most difficult lever to activate. Will cost-benefit analyses facilitate decision-making? Can they guide the definition of a more political project for the territory? What role will residents and citizens play in this decision-making process?"

"The most difficult thing is that the port is located in the Venice Lagoon. We are in a very delicate environment from a natural, cultural, architectural, and social point of view."

Fulvio Lino di Blasio, *president of the North Adriatic Sea Port Authority (ADSPMAS).*

The New Keys to Venetian Recovery

Stemming socioeconomic decline through research

Combining the **fight against monoculture tourism and environmentally harmful industrialization** requires diversification, remediation, and repurposing. This is the goal of the Venezia, World Capital of Sustainability Foundation, which, since 2000, has brought together public institutions, universities, cultural centers, and large companies to develop a sustainable economic model and diversify the local economy.

In Marghera, the national rehabilitation plan has led to the decontamination of the soil and the subsequent conversion of polluting activities into more sustainable ones. It is with this in mind that the Venice Gateway for Science and Technology (VEGA) was established, a science and technology park dedicated to nanotechnology and environmental repurposing. Developed between 1993 and 2004, VEGA was one of the most important manufacturing and academic research networks in Italy.

The field of R&D is increasingly attracting project leaders. One of the latest examples concerns the *Ospedale al Mare* on the island of Lido, initially slated for transformation into a luxury hotel-resort, much to the dismay of local residents. The conversion project has since been taken over by the German company CompuGroup Medical, which aims to turn it into a research center on the uses of artificial intelligence in healthcare by 2027. This research park, named *"Mare,"* will be accompanied by a new, energy-independent residential neighborhood to accommodate researchers, students, and families wishing to settle in Lido.

For the past thirty years, the idea of making Venice a global city of knowledge has been gaining momentum. The "*Venezia, città della conoscenza*" project, led by Benno Albrecht, rector of the IUAV University, aims to create a system of high-level research centers – in art, blue economy and design – in order to develop a Venetian knowledge-based economy. The proposal is also consistent with the provisions relating to the guarantee of socio-economic development contained in the **Special Law of 1973**.

Adopted a few years after the devastating floods of 1966, this law seeks to protect the landscape and the historical, archaeological, and artistic heritage of Venice and its lagoon, while seeking to increase the economic well-being of residents. By offering a high value-added alternative to generating income through tourism, an activity that is destructive to the environment and the city, the "City of Knowledge" initiative thus helps to improve the living standards of residents.

"There is a positive relationship between a population's level of knowledge and its per capita GDP."

Benno Albrecht,
rector of the IUAV University, Venice.

The project would also address the higher education deficiencies experienced by Veneto and, more broadly, Italy. At the European level, **the country has a particularly low educational attainment rate** for a state lacking natural resources, and, moreover, is the European nation that currently invests the least in higher education.

Furthermore, the Venetian labor market is mainly composed of low value-added jobs. **Making Venice a center of knowledge** would therefore open the possibility to alleviate certain aspects of the educational crisis in Veneto, while offering an economic alternative to all-out tourism as a generator of wealth.

"Veneto is one of the Italian regions with the lowest post-secondary education rates. Additionally, Venice has a negative migration rate: that is, people study here and then leave."

Francesco Rossi,
professor at the IUAV University, Venice.

Contending with economic and environmental crisis through sustainable reconversion

Beyond knowledge, a shift towards a cultural economy is also being considered. The Sandretto re Rebaudengo Foundation, created by a Turinese family who owns major contemporary art collections, recently acquired the island of San Giacomo in Paludo. The foundation hopes to organize cultural events there that will be open to the public for one month each year, and during the Biennale.

In formerly industrialized areas (Giudecca, Murano), the economy is also undergoing a transformation. The Murano archipelago, which still numbers active glass factories (20 in 2022) and others undergoing renovation, is striving to revive economic momentum around a cultural platform linked to glass, notably through the Adriano Berengo Foundation, which maintains partnerships with contemporary artisans.

Some start-ups, such as rehub, are studying ways to regulate the management of waste generated by glass production.

rehub

Launched twelve years ago, this start-up, born and based in Murano, specializes in recycling debris from the island's glass production. The waste is initially non-recyclable because its bright colors, characteristic of Murano glass, are obtained from heavy metals and toxic components (arsenic, cadmium, cobalt, etc.). At rehub, the broken pieces are transformed into a manually molded paste that produces design and architectural objects, reusing a material that was originally unrecoverable. By tackling the issue of glass waste management, which represents nearly 1,000 tons per year on the island (50 % of total glass production), Matteo Silverio and his team aim to contribute to a more environmentally friendly economic dynamic in Murano, while raising awareness on the issue of global glass recycling. They ultimately aspire to offer their patented processes to the industrial sector.

"Matteo Silverio is a good example with his Murano glass recycling process: Venice has a real ability to turn its problems into a vital force."

Patrice Duny,
director of the Caen Normandy Metropole Urban Planning Agency (AUCAME).

Giudecca, for its part, is undergoing a slow reconversion into a neighborhood of social housing, workshops, boat repair facilities, and hotels. The Ex-Junghans district, named after a former 19th century watch factory, was transformed into a residential area through a public-private partnership in 1995. Further along, the Molino Stucky—the famous mill of Giovanni Stucky, founder of the eponymous pasta brand—now houses a Hilton hotel. Its original rehabilitation plan also included the construction of social housing.

Most of these new projects have a sustainable vocation.

The San Giuliano Park, a former wasteland serving as an industrial dump between Venice and Mestre, for example, was converted into a green space in 2004.

Likewise, the VERAS association created a renewable energy community on the Vignole Island. Made up of residents working on the island, the association spearheaded the construction of a photovoltaic greenhouse to strengthen community cohesion and promote the agricultural heritage of the Vignole. The produce grown from the greenhouse is sold through a local retail outlet that showcases sustainable agricultural practices.

→ Molino Stucky, Giudecca Island

Conclusion

A land of innovation and adaptation, Venice is the result of a "skillful blend of trial, error, and hybridization"[27] which involves the right combination of plural geniuses. By understanding the mechanisms that govern the functioning of its surrounding environment, it is better able to apprehend it and, above all, to live with it. As the theme of the French Pavilion at the Architecture Biennale 2025, adaptation and **"living with"** aim to reduce vulnerability and make threatened areas more habitable. Acceptance of risk is the first step, followed by experimentation and the search for solutions.

In Venice, the journey continues along the path of reconversion and diversification, essential to prevent the city from atrophying as a result of a mono-economy of tourism, which denatures the city and deprives it of some of its essential functions. The interdependence of today's problems calls for appropriate initiatives that enable the city to combine demographic, economic and tourist appeal to safeguard its social, environmental and architectural fabric. This is an opportunity for Venice to lead the way once again. In the face of such urgency, Venice is more than ever "a planetary metaphor", to use Piero Bevilacqua's expression - and will perhaps be, tomorrow, a global example.

→ Exhibition at the Arsenale, Castello, Venice

"This is vulnerability: not deciding right away but learning first."

Éric Daniel-Lacombe,
architect and curator of the French Pavilion at the 2025 Architecture Biennale.

[27] Etienne Achille.

"Would we be willing to make as much effort as has been made in Venice to save more ordinary places?"

Thomas Beillouin,
architect and urban planner, specializing in territorial resilience issues at Artelia.

→ Canals of Venice

Key figures

DEMOGRAPHICS

Island population	**55,424 (in 2024)**
Mainland population	177,365 (in 2024)
Total population of Venice (including estuary areas)	251,801 (in 2024)
Average age of island population	**51.1 (in 2024)**
Average age of total population	48.6 (in 2024)
Average age in Italy	46.4 (in 2024)
Number of residents leaving Venice island in 2024 (including deaths)	**640 for Venice island, i.e. 1.3% of the population**
Number of residents leaving Venice since 2010 (including deaths)	11,132 for Venice island, i.e. 18.67% of its 2010 population

TOURISM

Estimated number of tourists per year	25 to 30 million
Total number of overnight stays per year in tourist establishments	12,628,079 (in 2023) 9,417,872 (in 2011) 11,262,458 (in 1999) 1,389,831 (in 1949)
Density of tourists sleeping on site in high season (May - August)	100,000 (per day)
Number of tourist accommodations in the historic center	8,640 (in 2023)
Maximum tourist capacity	20,750 (per day), i.e. 7,573,750 (per year)

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ECONOMY

GDP per capita (Venice island)	**€ 23,254.3 (in 2021)**
GDP per capita (total)	€ 22,099.45 (in 2021)
Average purchase price of a home in Venice	**€ 4,800 / m²**
Average price per square meter in Italy	€ 1989 / m²
Share of services in Venice's GDP	**76% (in 2014)**
Share of industry in Venice's GDP	15.7% vs. 18.5% nationally (in 2014)

ENVIRONMENT

Total surface area of the lagoon	550 km²
Average number of *acque alte*[4] over 1.10m per year since 2010 supérieures	**8**
Average number of *acque alte* over 1.10m per year at the beginning of the 20th century	0.5
Cost forecast of *acqua alta* losses in 2019	€ 1 billion
Rate of Venice's subsidence per year	2.5 cm

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→ Riva degli Schiavoni pendant le carnaval

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