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Turning adversity into opportunity

A BUSINESS PLAN FOR THE BALTIC SEA

BCG

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The WWF Baltic Ecoregion Programme is composed of WWF and nongovernmental-organization partners in each of the nine coastal Baltic Sea countries that are working together to conserve and restore the health of the Baltic Sea. Our work promotes a holistic and integrated approach to the conservation and sustainable management of the Baltic Sea while addressing the biggest threats facing this sensitive region, including eutrophication and overfishing. WWF is one of the world's largest and most experienced independent conservation organizations, with over 5 million supporters and a global network active in more than 100 countries. WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

TURNING ADVERSITY INTO OPPORTUNITY

A BUSINESS PLAN FOR THE BALTIC SEA

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CONTENTS

3 PREFACE

5 EXCUTIVE SUMMARY

8 CURRENT STATE
Unique but Endangered
Consensus on Three Main Issues
Progress Is Made but Degradation Continues
Better Positioned than Most to Meet a Global Challenge

15 OUTLOOK
An Uncertain Future Ahead
Tourism: Swim or Sink
Agriculture: Grow or Wither
Commercial Fisheries: Food or Pellets
The 550,000 Job Gap

22 TARGET STATE
An Integrated Approach and a Vision Shared by All
From Challenges to Business Opportunities

27 TURNING THE TIDE
Core Recommendations
Near-Term Challenges

30 CLOSING THOUGHTS

31 FOR FURTHER READING

32 NOTE TO THE READER

PREFACE

The Boston Consulting Group (BCG) has produced this report for the World Wide Fund for Nature (WWF) within BCG's existing global partnership with WWF, through which BCG provides WWF with pro bono support. The approach has been to use a corporate strategy and change management lens to view the environmental issues and complexities facing the Baltic Sea as well as the nine countries and 85 million people living within its dynamic region.

In the report we (1) give an overview of the current state of and the main issues facing the Baltic Sea; (2) explore two possible future scenarios and their potential impact on three selected industries—tourism, agriculture, and commercial fishing; (3) propose what a potential vision or target state could entail; and (4) suggest what needs to change to make the target state happen. Key findings in this report include the following:

- Currently the Baltic Sea is in critical condition. Consensus exists, however, on the primary threats facing the region: eutrophication, hazardous substances, and overfishing. Despite efforts to address these issues, deterioration continues. The region, which is financially strong and whose residents are highly educated, is still better positioned than most to address these global issues.

- The outlook for the Baltic Sea region is uncertain, but analysis of three industries—tourism, agriculture, and fishing—shows that in 2030 the difference between two potential scenarios could amount to 550,000 jobs and €32 billion in annual value added. This demonstrates that the health of the Baltic Sea is not only an environmental concern but an important economic and social one as well.

- An integrated cross-sectoral and cross-governmental approach is needed to achieve change and reduce the coordination difficulties present in the broad and complex network of stakeholders. Also, a shared vision is crucial in steering the region toward a desired target state. Actors in the private sector are in a good position to contribute to change, as the environmental challenges provide multiple business opportunities.

- Five core recommendations have been identified to turn the tide and generate improved, sustainable health for the Baltic Sea: (1) *focus on key priorities;* (2) *increase accountability;* (3) *take an integrated approach;* (4) *create commercial incentives;* and (5) *invest to develop the region into a "blue and green" technology hub.*

- Success in turning the tide will depend on near-term actions by all stakeholders around the Baltic Sea. This report proposes specific challenges as a way to start implementation of the key recommendations and accelerate change.

This report builds on the scenarios created by WWF in its "Counter Currents" report as well as on background data collected in its "Future Trends" report. Assessments are based primarily on existing data and trends; the future scenarios and implications include approximations and assumptions.

We aspire to create a sense of urgency and identify what actions are required to make the needed changes. Turning adversity into opportunity and understanding the prerequisites for creating a favorable outcome for the region's environmental, social, and economic interests now and in the future are central themes of this report.

EXECUTIVE SUMMARY

TURNING ADVERSITY INTO OPPORTUNITY: A business plan for the Baltic Sea describes the current state of the Baltic Sea, paints a picture of uncertainty regarding its future, and demonstrates that how we choose to manage our resources will have major impact on the economic and social well-being in the region. The report's central theme is turning adversity into opportunity by defining a desired target state that can increase momentum toward a better future for the Baltic Sea region and also create commercial opportunities around "blue and green" business models responding to environmental challenges.

Currently the Baltic Sea is in critical condition. Consensus exists, however, on the primary threats facing the region: eutrophication, hazardous substances, and overfishing. Despite efforts to address these issues, deterioration continues. The region, which is financially strong and whose residents are highly educated, is still better positioned than most to address these global issues.

- There is clear consensus among researchers on both the primary threats facing the Baltic Sea—eutrophication, hazardous substances, and overfishing—and the biological limits that need to be respected to reduce these threats.

- Areas without oxygen are increasing, and toxins in fish caught from some parts of the Baltic Sea, such as salmon and herring, are up to 2.5 times over the European Union (EU) limit. Despite recent progress, some important commercial fish stocks are depleted and at low historical levels.

- The rate at which the region is increasingly placing pressure on the sea is greater than the rate at which the region is able to prevent or mitigate the negative impact. Especially worrying is the low rate at which international agreements and conventions are being implemented.

- In finding solutions to globally shared challenges, the Baltic region is better positioned than most to find solutions. This raises the importance of showing global leadership and also opens potential for exporting solutions.

The outlook for the Baltic Sea region is uncertain, but analysis of three industries—tourism, agriculture, and fishing—shows that in 2030 the difference between two potential scenarios could amount to 550,000 jobs and €32 billion in annual value added. This demonstrates that the health of the Baltic Sea is not only an environmental concern but an important economic and social one as well.

- Economic activity directly related to environmental pressure in the Baltic Sea region is expected to increase, presenting a potential threat to the region's well-being.

- The extent to which the region might achieve integrated governance and minimize its environmental footprint creates the two possible scenarios for comparison. The total potential in annual value added and jobs generated differs significantly between scenarios, showing that not only the environmental but also the economic future of the Baltic Sea region is highly dependent on how we choose to manage our resources.

- Industries vary in how they affect or are affected by the health of the Baltic Sea, and there is strong interdependence among sectors. Thus costs and benefits cannot be analyzed in silos. Instead, a broad, multi-industry approach is needed when defining sustainable solutions for the Baltic Sea region.

An integrated cross-sectoral and cross-governmental approach is needed to achieve change and reduce the coordination difficulties present in the broad and complex network of stakeholders. Also, a shared vision is crucial in steering the region toward a desired target state. Actors in the private sector are in a good position to contribute to change, as the environmental challenges provide multiple business opportunities.

- The state of the Baltic Sea should not be the domain solely of the environmental sector and ministers but also of other sectors and ministries, such as finance, enterprise, and labor. Prime ministers must also be engaged. For change to succeed, all these sectors must share the same vision and overall goals and work in an integrated way toward these.

- The vision for the Baltic Sea region needs to be shared by and inspiring for all relevant stakeholders. By encompassing three main pillars—(1) the Baltic Sea is home to a healthy and robust ecosystem; (2) industries connected to the Baltic Sea are both competitive and sustainable; and (3) regional solutions to the challenges in the Baltic Sea have global relevance and therefore significant commercial potential—this vision can rouse inspiration within governments, across industries, in the public, and in the business community.

- Actors in the private sector are in a good position to aid change: as eutrophication, hazardous substances, and overfishing increase, so does international demand for blue and green business solutions, producing multiple future business opportunities.

Five core recommendations have been identified to turn the tide and generate improved, sustainable health for the Baltic Sea:

- *Focus on key priorities* and develop a clearly prioritized agenda that aims at high-impact initiatives within the three main problem areas of eutrophication, hazardous substances, and overfishing.

- *Increase accountability* to implement actions already agreed on. Support and empower regional bodies to enforce these actions, track progress, and optimize regionwide investments.

- *Take an integrated approach* to managing the Baltic Sea—across countries, sectors, and ministries—and incorporate environmental, social, and economic factors in defining sustainable solutions.

- *Create commercial incentives* by tying environmental costs closer to their source and use the innovative drive and power of the market to generate solutions.

- *Invest to develop the region into a blue and green technology hub* and work strategically to raise the rate of innovation and commercialization of ideas.

Success in turning the tide will depend on near-term actions by all stakeholders around the Baltic Sea. This report proposes specific challenges as a way to start implementation of the key recommendations and accelerate change.

- *To the nine costal countries around the Baltic Sea:* Develop a new or extended vision for the Baltic Sea region encompassing environmental, social, and economic aspects. Define a target state and the main strategic initiatives needed to reach it.

- *To the major political parties:* Define and present your view of the Baltic Sea target state and what reforms you will seek to achieve it.

- *To the business community:* Define the link between your company's core business and the health of the Baltic Sea to identify blue and green business opportunities and potential for focused corporate social responsibility initiatives.

- *To the media:* Track and debate the Baltic Sea's environmental, social, and economic progress. Observe all stakeholders and their role in change. Provide space to highlight positive development.

If the rate of innovation and commercialization of ideas does not go up, our environmental deficit and debt will remain and potential economic gains go unrealized. The Baltic Sea's health is not only an environmental concern but also an important economic and social one.

CURRENT STATE

WHAT IS THE CURRENT state of the Baltic Sea? It is a unique but endangered sea. There is consensus about the primary threats facing it, and actions are taken, but degradation continues. The region is wealthy and its residents are highly educated, and therefore it is well equipped to make substantially more progress than what has currently been achieved.

Unique but Endangered

It might not appear so from the surface, but the Baltic Sea is an extreme environment. The brackish water ecosystem demands that species adapt from either their freshwater or saltwater origins. Thus many of them live close to their survival limits. The sea is almost fully enclosed, with only a narrow outlet to the North Sea, implying a slow water exchange and a renewal cycle of over 30 years. In addition, the catchment area is nearly four times the size of the sea itself. Ultimately, the Baltic Sea may have lower biodiversity than some other marine environments but is unique and sensitive to human activity.

The Helsinki Commission's (HELCOM's) latest assessment of the sea's health shows that only 25 percent of the sub-basins in the Baltic Sea have a good or moderate health status. Seventy-five percent are defined as poor or bad, significantly deviating from an undisturbed state and threshold values for pollution.[1] Since the 1960s, the share of the seabed that completely lacks oxygen (anoxia, less than 0 ml oxygen/l) has increased from 3 percent to 14 percent. Today the share of the seabed considered dead because of hypoxia (less than 2 ml oxygen/l) covers 27 percent of the Baltic Sea bottom, corresponding to an area almost two times the size of Denmark.

Despite some recent signs of improvement, fish stocks in the Baltic Sea have declined, and today some important fish species are at 30 to 40 percent below their historical average.[2] Some fish are also highly affected by toxins. Fatty fish, such as salmon and herring caught from some parts of the Baltic Sea, exceed the European Union's (EU's) legislated limit of dioxins and polychlorinated biphenyls (PCBs) by up to 2.5 times, rendering the fish illegal to be sold within the EU.[3] Finland, Latvia, and Sweden, however, have been granted an exception from this directive and are therefore allowed to sell fish with high toxic levels locally in their respective countries, although their export to other EU countries is banned.[4]

Consensus on Three Main Issues

Even though a complex set of often interacting issues contributes to the current state of the Baltic Sea, there is clear consensus among experts on what the major threats are: eutrophication, hazardous substances, and

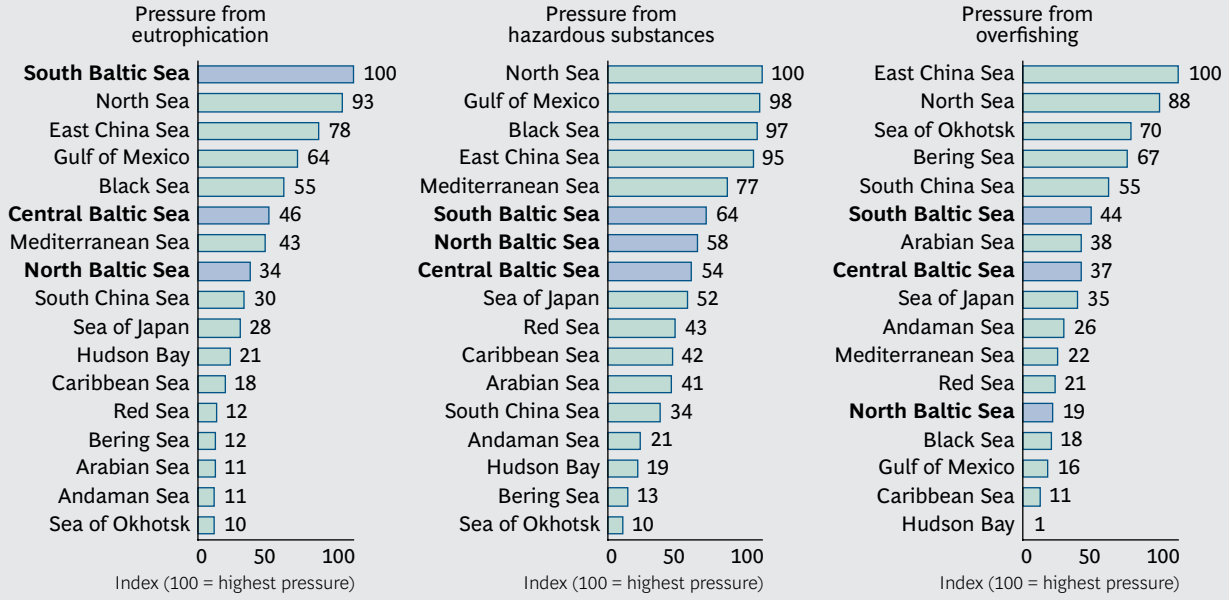
overfishing. An international comparison of these three issues shows that the Baltic Sea faces some of the highest environmental pressures in the world. (See Exhibit 1.) The southern parts of the sea are most severely affected by human pressure, and also have the highest pressure of all seas in the world from eutrophication—worse than, for example, the North Sea, East China Sea, Gulf of Mexico, and Black Sea. Although the pressure is lower in the central and northern parts of the sea, the sensitivity is higher because of the lack of inflow of new saltwater. The combination of high pressures and a sensitive ecosystem leads to severe environmental effects in the Baltic Sea. On top of these pressures, the effects of climate change—including higher surface-water temperatures and increased runoff—will make the situation even more challenging in the future.

Eutrophication is caused by excess nutrients—mainly nitrogen and phosphorus—entering the sea. The two main sources of nitrogen and phosphorus inflows are agriculture (runoff from fertilizers and manure, which accounts for 50 to 65 percent of nutrient inputs) and municipal wastewater (15 to 25 percent of nutrient inflow).[5] The most visible effects of eutrophication in the Baltic Sea are severe algal blooms. Eutrophication also decreases water quality because large amounts of plankton and algae reduce visibility and oxygen levels. When oxygen levels are so low that marine life cannot survive (less than 2ml/l), the seabed is considered dead. When the bottom sediment lacks oxygen, it also releases large amounts of phosphorus (the "internal load"), contributing further to eutrophication. (See the sidebar "Eutrophication Deprives the Sea of Oxygen.")

Hazardous substances have a major impact on the Baltic Sea and stem from industrial production, municipal waste, household activities, and consumption. (See the sidebar "Hazardous Substances Make Fish Unfit for Human Consumption.") Three types of substances stand out because of the potential severity of their effects and the limited data on their possible effects: flame retardants, dioxins, and pharmaceuticals.

Flame retardants are substances that are used on clothes, furniture, and building materials to reduce the risk of fire. Chlorine- and bro-

Exhibit 1 | The Baltic Sea Is Facing High Environmental Pressure



Sources: National Center for Ecological Analysis and Synthesis: "A Global Map of Human Impacts to Marine Ecosystems" (*Science*, 2008); BCG analysis.
Note: Comparison of 15 major seas, based on size. Benchmark has been performed using the human impact score for each driver (National Center for Ecological Analysis and Synthesis). The scores have then been indexed. South Baltic Sea is defined as Bay of Mecklenburg, Great Belt, Kattegatt, Kiel Bay, and Little Belt. Central Baltic Sea is defined as Eastern Gotland Basin, Gulf of Finland, Gulf of Gdansk, Gulf of Riga, Northern Baltic Proper, and Southern Baltic Proper. North Baltic Sea is defined as Åland Sea, Archipelago Sea, Bothnian Bay, Bothnian Sea, and the Quark.

EUTROPHICATION DEPRIVES THE SEA OF OXYGEN

According to HELCOM's "Approaches and Methods for Eutrophication Target Setting in the Baltic Sea Region" (2013) and Swedish Meteorological and Hydrological Institute Fact Sheet No. 56 (2012):

- Oxygen depletion of bottom waters is closely linked to eutrophication.
- Today 27 percent of the Baltic Sea's seabed is considered dead from hypoxia (less than 2 ml oxygen/l).
- The share of the seabed that is anoxic (under 0 ml oxygen/l) went up from 3 percent in 1960 to 14 percent in 2012.
- Water transparency decreased from an average of 9.5 meters in the beginning of the 1900s to 6 meters in 2009.

mine-based flame retardants have been linked to cancer, disruptions in hormonal balance, and learning problems. *Dioxins* are byproducts from combustion processes such as burning of garbage and production of chemicals containing chlorine. They can affect the development of the brain and nervous system and are also linked to cancer, hormonal disruptions, and reduced reproductive capability. *Pharmaceuticals* are released into the water from production sites as well as through wastewater. The full effects of many currently used pharmaceuticals on the environment have not yet been explored, but changes in physiology, behavioral patterns, and hormonal levels as well as decreased reproductive abilities have been observed in fish and other aquatic animals. Knowledge about a multitude of substances and their potentially harmful effects is still limited, and the fact that solid data frequently are lacking further impedes progress.

Shipping in the Baltic Sea also contributes to the inflow of hazardous substances, both from routine operations and from accidents. Routine discharges can come from activities such as the use of toxic antifouling paints on ship hulls, air emissions, and leakage of lube oils, while accidents leading to oil or chemical spills could result in devastating consequences for the Baltic Sea.

Overfishing not only depletes the specific species caught, it also changes the sea's food-web structures. Predators are affected negatively when the fish they normally eat decrease, while prey fish and organisms increase and take over as their natural predators disappear. Fishing in the Baltic Sea is regulated by the EU Common Fisheries Policy; specific quotas are set for each of the most important commercial species. Because these quotas historically have been higher than the reproductive capacity of the ecosystem, they have led to de-

HAZARDOUS SUBSTANCES MAKE FISH UNFIT FOR HUMAN CONSUMPTION

- Between 2000 and 2011, fatty fish from parts of the Baltic Sea contained PCB and dioxin levels that exceeded EU-legislated limits by up to 2.5 times, making these fish illegal to be sold for human consumption (Swedish National Food Administration; BCG analysis).
- In 2012, Finland, Latvia, and Sweden were granted a permanent exemption to the EU ban, allowing sale of these fish for national consumption despite past decades' lack of improvement of dioxin levels (EU Commission regulation 1259/2011; Swedish Environmental Protection Agency).
- As of 2010, fish and other seafood were the main source (roughly 70 percent) of dioxins and PCBs in Swedish adults (Swedish National Food Administration).

pleted fish stocks.[6] Overfishing also occurs through by-catch and illegal fishing. (See the sidebar "Commercial Fish Stocks Are at Low Levels.")

Progress Is Made but Degradation Continues

A number of actions have been taken to diminish the primary threats and improve the health of the Baltic Sea. Certain hazardous substances have been controlled through bans and restrictions—for instance, DDT, lead in gasoline, chlorinated flame retardants, and industrial emissions of dioxins.[7] Nutrient inflows have been reduced through improved wastewater treatment in cities and industries. Overfishing has been lessened by adjusting quotas for cod, herring, and sprat to levels recommended by scientists and through multiannual plans for cod.[8] Although improvements have been seen, the eutrophication, algal blooms, and expansion of dead zones continue; fish stocks are at low historic levels; and many fish are still too toxic to eat, demonstrating that hazardous substances are still a major concern.

The Baltic Sea remains in a critical state, with pressures increasing, and there are still many areas where needed actions have not been taken. In addition, new complexities such as the effects of climate change will further challenge an already urgent situation. Thus, a dynamic perspective is needed rather than a static one. The rate at which the region is intensifying the pressure on the sea and generating new threats is greater than the rate at which the impact is prevented or mitigated.[9] This creates a deficit that, over time, has built up a substantial environmental debt. Unless the rate of execution, development, and implementation of legislation, innovation, commercialization, and concrete actions for impact reduction catches up with the existing and potential future threats, the deficit will remain and the debt will continue to increase despite the slow but steady progress.

The health of the Baltic Sea relies on a complex governance arrangement consisting of national governments of all nine coastal countries, local and national laws, regional conventions, and EU directives and legislation. HELCOM works to protect the Baltic Sea environment through intergovernmental cooperation between the countries surrounding the sea and the European community. But HELCOM does not have any binding authority, and what is agreed on is dependent on the individual countries, called contracting parties, to implement.

Of the many framework agreements aiming to protect and restore the Baltic Sea, two stand out in their approach. The first is the *EU Strategy for the Baltic Sea Region*[10] (EUSBSR) and the second is the *HELCOM Baltic Sea Action Plan* (BSAP).[11] The EUSBSR—the EU's first macroregional strategy, endorsed by the European Council in October 2009—is unique in its approach in that it seeks to facilitate the optimal economic, environmental, and social development of the region under three primary

COMMERCIAL FISH STOCKS ARE AT LOW LEVELS

According to the ICES Fish Stock Summary Database:

- The number of cod has declined 70 percent since record levels in the 1980s. In 2011 the level was around 30 percent lower than the historical average,[1] although it has recently shown signs of recovery with some stocks being certified sustainably caught.
- The stock of herring has gone down by 60 percent in the same period. In 2011 it was almost 40 percent lower than the historical average.
- Sprat has declined 60 percent since the 1980s. In 2011 its level was around 15 percent below the historical average.

NOTE
1. Historical average encompasses 1970 (or 1974) through 2011.

objectives: to save the sea, to connect the region, and to increase prosperity. The HELCOM BSAP was agreed to and signed by all nine countries surrounding the Baltic Sea and includes actions and targets that should be implemented, reported on, and reached in order to "restore the good ecological status of the Baltic marine environment by 2021." Other political frameworks of significance to the environmental status of the sea include the EU Water Framework Directive and the Marine Strategy Framework Directive, which have set up targets to reach "good ecological status" for all European waters by 2015 and "good environmental status" of all European seas by 2020, respectively. The Common EU policies for agriculture (CAP) and for fisheries (CFP) are also critical in terms of their influence on domestic incentives for dominant drivers of environmental deterioration of the sea. They also have an enormous social and economic impact on the region, given their scope and influence.

However, even if targets related to, for example, implementation of certain regulations and processes are agreed on, the corresponding actions and transparency of progress in implementation are often lacking. (See Exhibit 2.)

In a recent WWF review of the status of implementation efforts of the Baltic Sea Action Plan,[12] the assessment was that no country has implemented and reported on all the actions they have committed to in the BSAP in a timely manner. Similarly, the implementation of the EU Marine Strategy Framework Directive is lagging.[13] This delay in implementation is especially worrying given the need to close the environmental deficit.

Better Positioned than Most to Meet a Global Challenge

The challenges of eutrophication, hazardous substances, and overfishing are increasingly global in nature (see Exhibit 3): research shows that over 40 percent of the world's oceans are heavily affected by human activity.[14] Excess usage of nutrients is widespread around the world, and in many countries eutrophication is considered the most important water-quality challenge. The release of hazardous substances is a factor in environmental pressure worldwide, and global water pollution is escalating even if some regions have showed improvements. Many of the world's oceans are stressed by overfishing, and large portions of global marine stocks are overfished. In 2009, approximately 60 percent of examined global fish stocks were estimated to be fully exploited, and among the remaining stocks about 30 percent were overexploited.[15]

EXHIBIT 2 | Actions Are Agreed on, but Many Are not Executed on Time

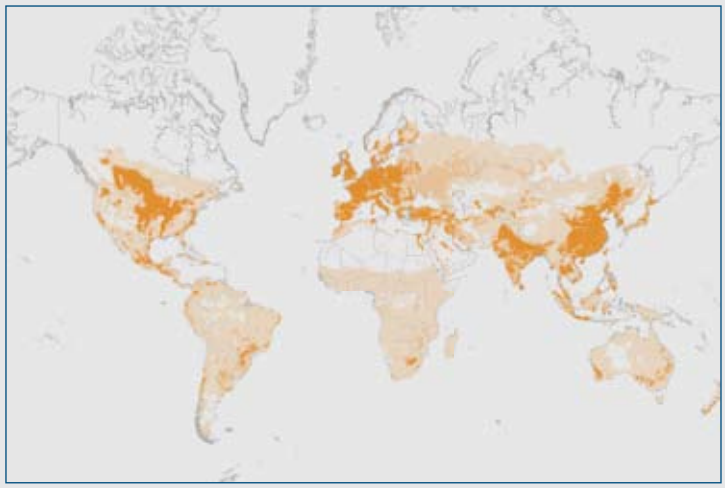
Baltic Sea Action Plan implementation score 2013

BSAP segment	Finland	Germany	Estonia	Sweden	Denmark	Latvia	Poland	Lithuania	Russia
Eutrophication	0	0	−3	−2	−8	−5	−6	−11	−8
Hazardous substances	−2	−4	−13	−2	−9	−11	−13	−8	−11
Biodiversity	−15	−22	−13	−28	−15	−18	−18	−24	−28
Maritime activities	−8	−7	−8	−5	−7	−6	−7	−8	−5
Total score	**−25**	**−33**	**−37**	**−37**	**−39**	**−40**	**−44**	**−51**	**−52**

"Good" (ahead of schedule) "Acceptable" (on schedule) "Not acceptable" (behind schedule)

Source: WWF: "Baltic Sea Action Plan–Is It on Track?" (2013).
Note: Timely implementation of each assessed action will produce a zero score. Implementation ahead of time will produce a positive score, whereas delays in implementation, or no implementation at all, will produce a negative score. Failure to meet already passed deadlines will produce even lower scores. The graph represents a snapshot of the state of implementation as of June 1, 2013. The assessment is based on what contracting parties had actually reported to the HELCOM secretariat before this date.

Exhibit 3 | The Challenges of the Baltic Sea Are Global



Eutrophication

Average annual nitrogen balance (pounds per acre)

Excessive use of nitrogen (221)

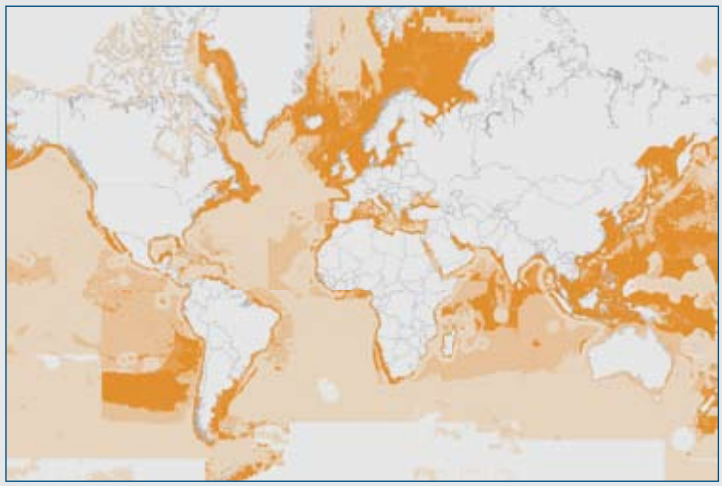
Efficient use of nitrogen[1] (0)

Hazardous substances

Land-based pollution[2]

High pressure from pollution

Low pressure from pollution



Overfishing

Overfishing[3]

Significant overfishing

Sustainable fishing

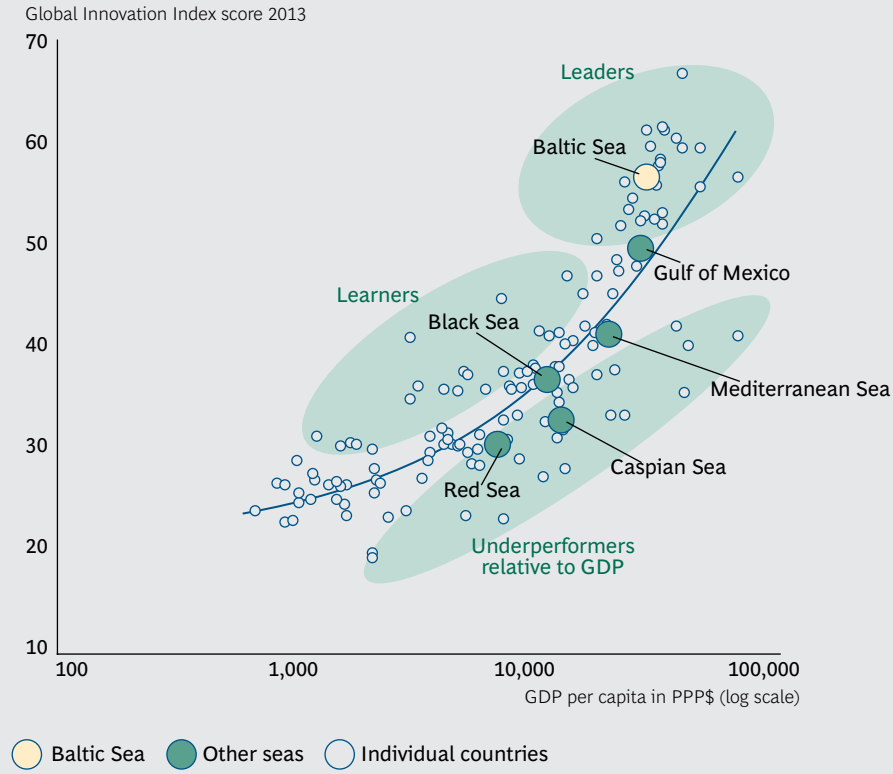
Sources: EarthStat: University of Minnesota Institute on the Environment and McGill University, Land Use and the Global Environment; National Center for Ecological Analysis and Synthesis: "A Global Map of Human Impacts to Marine Ecosystems (*Science*, 2008).
[1]Efficient use of nitrogen, indicated by a balance of 0 pounds / acre, means that the exact amount of applied nitrogen was used by the crop.
[2]Graphic shows aggregated pressure from organic pollutants (pesticides) and nonpoint source inorganic pollutants (primarily urban runoffs).
[3]Graphic shows aggregated levels of pelagic and demersal fishing, adjusted for organic productivity in the region.

In many ways, the Baltic Sea region is better positioned than most to find solutions to these challenges and thereby provide examples that can serve as global inspiration. (See Exhibit 4.) The financial strength of the region is high, the population is well educated, and strong domestic companies are based in the region. The scientific foundation is solid, and research quality is high. Relevant conventions, agreements, and action plans are in place. Population density is lower than that of many developing regions, and—unlike many other areas—the region is stable and not plagued by poverty, war, or other major conflicts. According to a comparison of the region's Global Innovation Index and its purchasing power with those of other areas, the Baltic Sea region can be considered a relative leader in innovation. In short, the region has better prerequisites than most to address the issues of eutrophication, hazardous substances, and overfishing. This fact amplifies the importance of the Baltic region's need, and responsibility, to show global leadership.

NOTES

1. HELCOM.
2. International Council for the Exploration of the Sea (ICES).
3. Swedish National Food Administration; BCG analysis.
4. European Commission; Swedish National Food Administration.
5. HELCOM.
6. ICES.
7. HELCOM.
8. European Commission; ICES.
9. WWF Baltic Ecoregion Programme: "Future Trends in the Baltic Sea" (2010).
10. Information and official documentation can be obtained from the EUSBSR homepage.
11. 2007.
12. WWF Baltic Ecoregion Programme: "Baltic Sea Action Plan—Is It on Track?" (2013).
13. European Commission.
14. National Center for Ecological Analysis and Synthesis: "A Global Map of Human Impact on Marine Ecosystems" (2008).
15. United Nations Food and Agriculture Organization: "Review of the State of World Marine Fishery Resources" (2011).

EXHIBIT 4 | The Baltic Sea Region Is in a Unique Position to Find Solutions



Sources: Global Innovation Index 2012; World Bank.
Note: Regional values weighted in length of coast toward sea, per country. PPP = purchasing power parity.

OUTLOOK

WHAT DOES THE FUTURE of the Baltic Sea region look like? It is uncertain, as economic activity directly related to environmental pressure in the Baltic Sea region is expected to increase, presenting a potential threat to the region's well-being. Analysis of the future development of three industries—tourism, agriculture, and fishing—demonstrates that the way we choose to handle our resources will have major consequences for economic and social well-being in the region. By changing the trajectory of the Baltic Sea region, we could add 550,000 jobs and €32 billion in annual value to the economy by 2030, as opposed to a scenario where we do not improve the sustainability of our actions.

An Uncertain Future Ahead

During the past, environmental pressures such as pollution, overexploitation of resources, and eutrophication have risen, and such human-caused activities will likely keep on increasing. Economies around the Baltic Sea are growing faster than most of those belonging to European peers,[1] and several sectors affecting the Baltic Sea have a significant growth outlook.

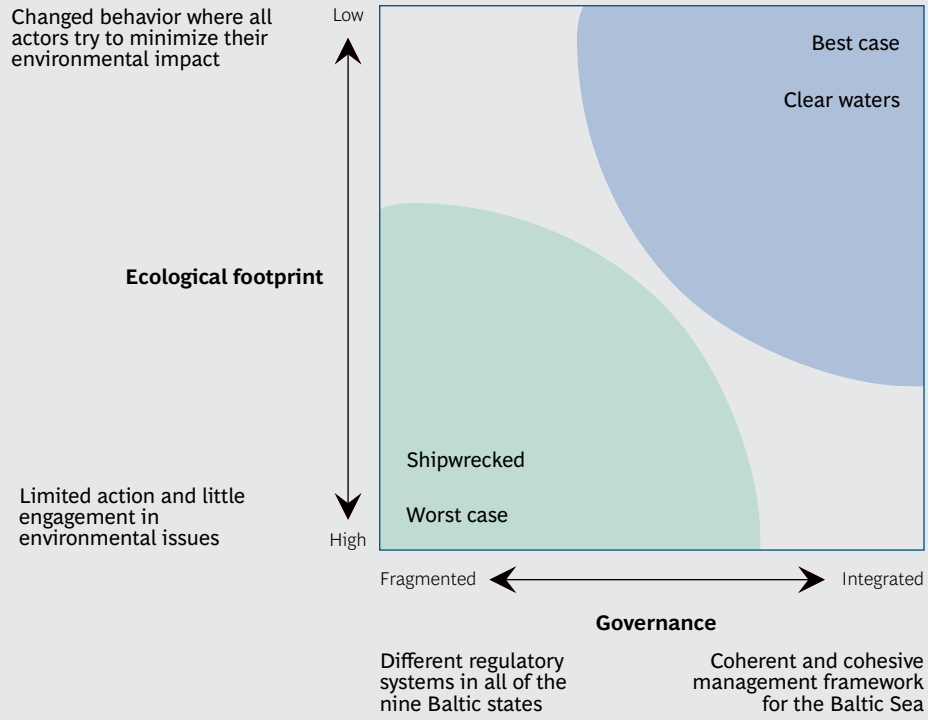
Shipping in the Baltic Sea has doubled since the early 1990s,[2] and growth is expected to continue, driven mainly by increased exports from countries along the eastern shores, especially in the St. Petersburg area.[3] Therefore more and larger ships will operate in the Baltic Sea. Tourism in coastal regions has also expanded greatly in recent decades, and the future growth potential—which is considered high—would result in increased exploitation of coastal regions.

Considering the potential impact of these and other industries on the Baltic Sea, it is clear that the region's future development is highly dependent on how we choose to manage our human activities. In the WWF "Counter Currents"[4] report, two strategic dimensions have been used as a basis for the development of future scenarios. The first concerns how well the region's governance is integrated, and the second relates to the size of our ecological footprint.[5] (See Exhibit 5.)

The scenarios used in this report are in large part built on the WWF "Counter Currents" report as well as on background data collected in the WWF "Future Trends" report. The assessments are, to the extent possible, based on existing data and trends, but for the scenarios, estimations and assumptions have been made.

In the most positive scenario (also referred to as "clear waters"), a high level of collaboration has been achieved through governance that has been integrated among countries and sectors. At the same time, the ecological footprint has been minimized by all actors.

Exhibit 5 | Two Scenarios Are Illustrated



Source: WWF: "Counter Currents" (2012).

Both governments and the private sector are collaborating, guided by widespread awareness and a sense of collective responsibility. Species and habitats are showing strong signs of recovery, and levels of hazardous substances in the marine environment are gradually declining. Overall, improvement from previous decades of neglect and mismanagement is slow but ongoing. The Baltic Sea region has become a global showcase of the ways in which integrated action and regional governance can make a real difference.

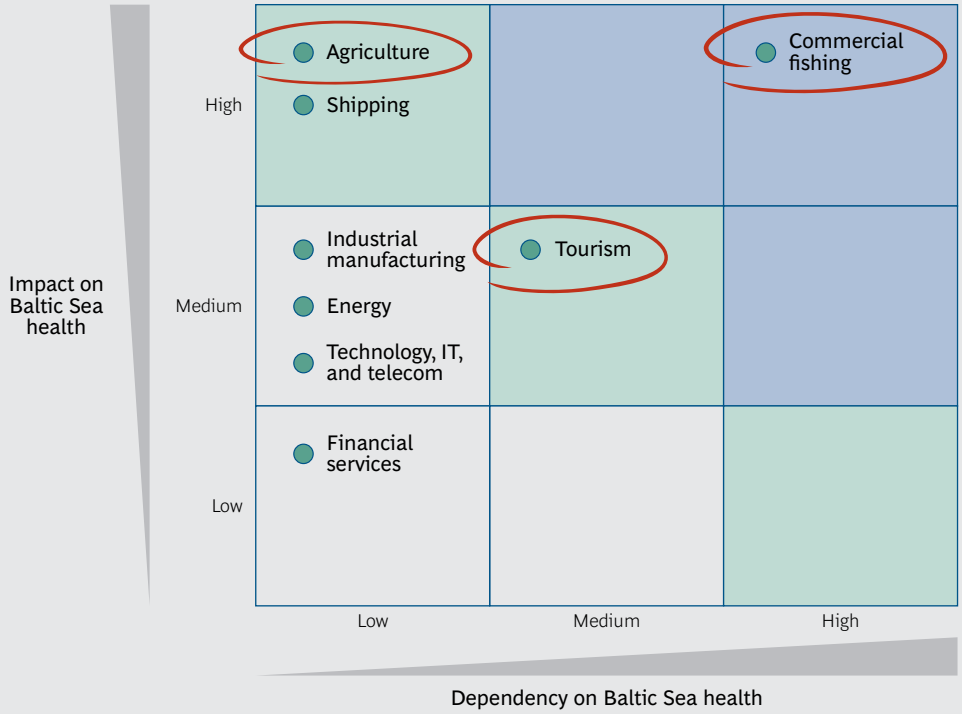
In the least positive scenario (also referred to as "shipwrecked"), mistrust and fragmentation have steered the Baltic Sea trajectory toward accelerated degradation. Political fragmentation has resulted in country-by-country solutions that have a short-term and often crisis-driven focus. Actors in both the public and private sectors display widespread apathy. Yearly algal blooms have exploded, and the size of dead zones has grown. As a result, the Baltic Sea is no longer suited for either fisheries or tourism. Around the world the Baltic Sea is often used as a cautionary example of how not to manage other marine regions.

Almost all industries would directly or indirectly be affected in these two scenarios. However, the roles of different industries vary because some industries influence the state of the Baltic Sea and others are instead influenced by it. We have chosen to take a closer look at three of these industries, each of which has a distinct role: tourism, agriculture, and commercial fishing. (See Exhibit 6.)

Tourism: Swim or Sink

Tourism is an economically important industry in the countries around the Baltic Sea. In 2012 an estimated €42 billion was generated in the coastal regions. (See Exhibit 7.) Despite the recent economic downturn, coastal tourism has risen by 5.3 percent annually since 2009. The strongest boost has been observed in Russia and Sweden, which have annual growth rates of 9.7 and 6.9 percent, respectively. This growth of coastal tourism is being driven mainly by beach tourism, recreational boating, cruise tourism,

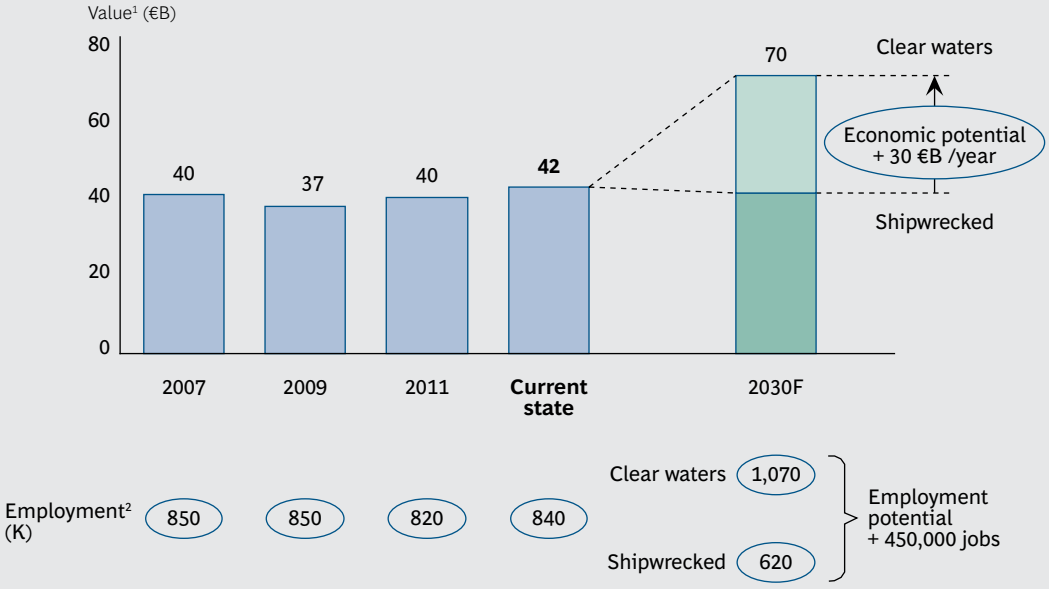
Exhibit 6 | Relationships Between Selected Industries and the Seas Vary



Sources: WWF and BCG assessment.

Exhibit 7 | Tourism

Difference of +€30B and 450,000 Jobs



Sources: Eurostat; Fisheries Center; Fiskeriverket; national statistics; World Travel and Tourism Council (WTTC); BCG analysis.
Note: Coastal tourism approximation-based visitor surveys and NUTS3 regional division; WTTC.
[1]Value = gross / real value added at constant (2012) prices. Total value (direct plus indirect plus induced) is equivalent to all tourism spending minus purchases made by the industry.
[2]Employment = total number of jobs generated (direct plus indirect plus induced).

and recreational fishing. Coastal tourism in the Baltic Sea region is still more or less unaffected by growing environmental concerns, and the demand continues to exceed supply in many coastal regions.[6]

Clear waters state: Marine environmental issues have been and are being addressed to such an extent that they no longer pose a threat to the tourism industry. The industry's already strong growth has been maintained without extending the ecological footprint, and coastal tourism in the Baltic Sea region has continued to grow at a historical rate of 4 to 5 percent annually up to 2030. Some segments have seen particularly strong gains; ecotourism is booming, and recreational fishing is advancing by almost 6 percent annually, the value it generates surpassing that of the region's previously heavily subsidized commercial fishing industry (up from €350 million in 2012 to €1 billion in 2030).

In 2030 coastal tourism has grown from €42 billion to around €70 billion in annual value add. Productivity has seen a significant rise, but total employment has also gone up to over 1 million in 2030, an increase of around 230,000 tourism jobs above today's levels.[7]

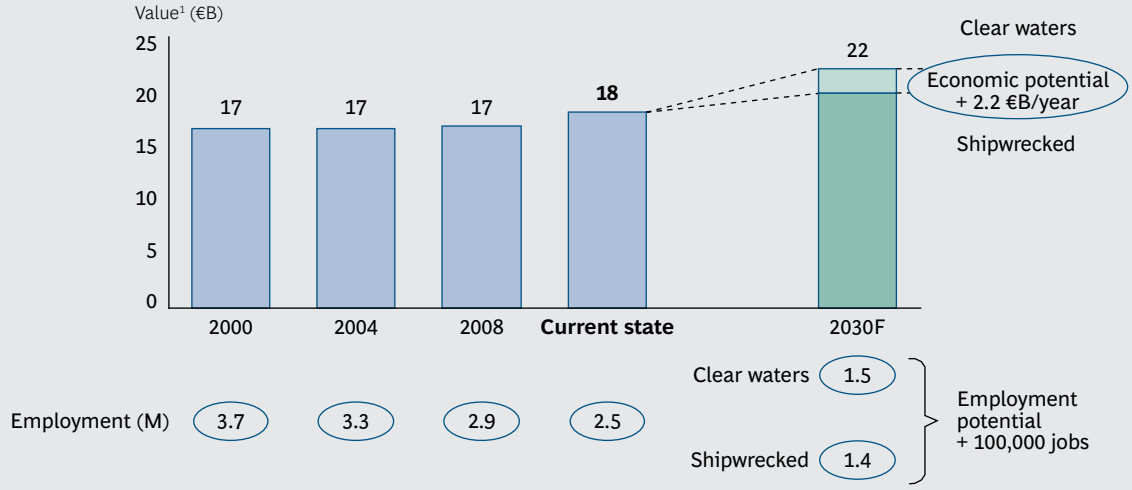
Shipwrecked state: With continued degradation of the marine environment, tourism in the Baltic Sea region has been unable to sustain the previously high growth rates and is advancing only nominally at the rate of inflation (about 2 percent annually). The most apparent problems can be observed in beach tourism, where flourishing algal blooms have resulted in empty beaches, and in recreational fishing, where toxic substances and reproductive disorders in sea life have forced fishers to visit other marine areas that are not facing the same problems as the Baltic Sea.

In 2030 costal tourism generates €40 billion of value added, characterized by mounting environmental problems. In the years leading up to 2030, annual growth has been lower than the general productivity increase in the industry. As a result, total tourism employment has decreased by 220,000 jobs in the Baltic Sea region between today and 2030.

Agriculture: Grow or Wither

Today, the agricultural industry in the Baltic Sea catchment area employs around 2.5 million people, of which 75 percent work in Poland. The total gross value added from animal and crop production in the area was estimated at €18 billion in 2012 (see Exhibit 8), roughly the same as the GDP of Estonia. Agricultural employment is in a constant

Exhibit 8 | Agriculture
Difference of +€2.2B and 100,000 Jobs



Sources: Baltic Drainage Basin Report; Eurostat; Organization for Economic Co-operation and Development (OECD); Word Bank; BCG analysis.
Note: Agricultural value added is from crop and animal production in the Baltic Sea catchment area (excluding Belarus, Ukraine, the Czech Republic, and the Slovak Republic).
[1]Value = gross / real value added at constant (2012) basic prices.

downward-sloping trend, declining by around 3 percent annually in recent decades. The value generated fluctuates and shows only moderate long-term growth, more or less on par with inflation levels.

Despite an overall steady-state industry, demand and willingness to pay for high-quality organic food is growing quickly in the Baltic Sea region at around 10 percent annually since 2006. Sweden and Estonia lead the way, but organic farming is growing fastest in Poland. Organic farming per se is not a guarantee for low environmental impact (excessive use of organic fertilizers also causes eutrophication, and it generally results in lower yield), but its rising popularity does reflect an important trend—greater awareness of the environmental consequences of agricultural production.

The Baltic Sea's future depends on how we choose to manage our resources.

Clear waters state: The agricultural industry has realized that increased output cannot come at the expense of the environment. This is true for a growing number of organic farmers but is also relevant for conventional farming. Discussions about food and the environment have initiated a demand for more-effective agriculture that has lower environmental impact—whether it be organic or conventional. Best-practice sharing and cross-regional use of innovative local initiatives have been actively promoted. As a result, responsible low-pressure agriculture in which new techniques are actively helping farmers apply the right amount of nutrients and limit their overall environmental impacts has become the new "conventional" way in agriculture. The low-pressure segment of the agricultural industry is growing at a rate of around 10 percent annually. The new techniques have also minimized industry-wide need for chemical inputs, thus improving profitability because chemical inputs have become increasingly expensive in the new green economy.

In 2030 low-pressure agriculture has yielded up to 100,000 new jobs more than the shipwrecked state, partly offsetting the otherwise downward-spiraling employment trend in agriculture. A mounting public willingness to pay extra for products that minimize the environmental impact has generated additional value add of €2.8 billion annually that would not have been obtained if focus had not shifted from high- to low-pressure agriculture.

Shipwrecked state: Because there has been little change in the way the agricultural industry has developed around the Baltic Sea, greatly increased nutrient loads exist in the entire region. The Baltic Sea region struggles to compete on price. The industry has missed out on potential profits from low-impact products and has instead continued to grow with moderate rates of around 3 percent annually throughout the region, with some additional growth dampening in the Baltic States. As a result of the high-pressure agriculture and methods that are insufficient to reverse the negative impact on the phosphorus cycle from agriculture and urbanization, the supply of mined phosphorus ("peak phosphorus") is running out. This has become an escalating concern as the dwindling supply weakens the industry's long-term outlook and foreshadows substantially higher costs in the future.

In 2030 high-pressure farming dominates the market completely. Local initiatives to build successful businesses around low-pressure agriculture struggle with unstable markets and a lack of knowledge and innovation. Governmental focus has been shifted away from low-pressure agriculture. Overall continued historical growth with some dampening in the Baltic States and without an increase in low-pressure agriculture has resulted in a €2.2 billion lower annual value added than that of the clear waters state. The downward-spiraling employment trend has also continued and resulted in more than 1 million additional job losses between today and 2030. Poland accounts for more than two-thirds of these.

Commercial Fisheries: Food or Pellets

Compared to agriculture and tourism, commercial fishery today is a relatively small in-

dustry in the Baltic Sea region. The total gross value added is estimated to be a modest €117 million, and total employment is around 22,000 people, including indirect employment. (See Exhibit 9.) Commercial fishery is a heavily subsidized industry in the countries around the Baltic Sea. In 2009, total subsidies to the Baltic Sea fishing industry—excluding fuel subsidies—amounted to an estimated €278 million,[8] or 1.5 times the total value of all the fish caught. When including fuel tax reductions, total fishing subsidies are in excess of €500 million, or 2.8 times the total value of all the fish caught. Both employment and output have declined in recent decades, but the industry still has considerable overcapacity.

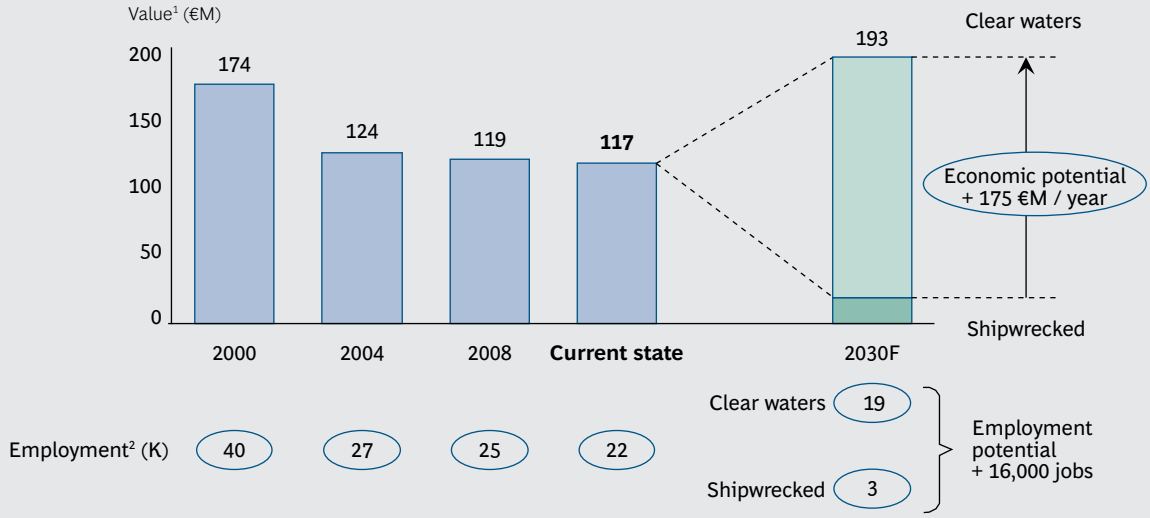
Clear waters state: Commercially important fish stocks have shown strong recovery from today's stock levels (for example, assuming three times as many cod[9]), and most fish can be sold for human consumption because the level of toxic substances has come down. A notable fleet reduction and a greater use of existing vessel capacity have left the Baltic Sea region with a competitive and commercially viable fishing fleet that no longer needs to be subsidized. Instead, the fishing industry is growing sustainably and up to €500 million are being saved annually on fishing-related subsidies and tax reductions. Recovering fish stocks have resulted in significantly higher sustainable fishing quotas that in turn have brought about larger and more profitable catches per boat.

Between today and 2030 the annual gross value added has increased 1.7 times, to €193 million. Despite an initial reduction of direct employment, total employment in 2030 is in an upward trend,[10] and the jobs generated no longer require government subsidies.

Shipwrecked state: Ineffective fisheries management and poorly targeted subsidies have created a spiraling impairment of the fishing industry. Misdirected incentives have resulted in continued overfishing and environmental degradation, which in turn have led to the collapse of several Baltic Sea fish stocks (for example, the commercially important cod). In 2025 governments around the Baltic Sea realized that commercial fishing had become nonviable, but not before total subsidies in excess of €6 billion (based on current subsidy levels) had been paid out for the period between 2013 and 2025.

By 2030 fish stocks have collapsed, mainly because of continued overfishing, eutrophica-

EXHIBIT 9 | Commercial Fishing
Difference of +€175M and 16,000 Jobs



Sources: Eurostat; Food and Agriculture Organization of the United Nations; ICES; Oceana; Scientific, Technical and Economic Committee for Fisheries (STECF); WWF; BCG analysis.
Note: The value shown is based on recorded commercial landings from Baltic Sea subdivisions 27.IIIb, c, d. Total employment is estimated using the EU average fishery employment multiple of 1.4 indirect jobs per direct job.
[1]Value = gross / real value added at constant (2012) basic prices.
[2]Employment = total employment (direct and indirect).

tion, habitat destruction, and higher levels of toxic substances that have caused reproductive disorders in sea life. Most of the commercial value has been erased, and the extent of fishing activities permanently reduced. Some fishers have shifted to other remaining species, but the total value added has slumped to around €19 million and total industry employment has gone down by almost 80 percent between today and 2030, a decline resulting in over 19,000 lost jobs.

The 550,000 Job Gap

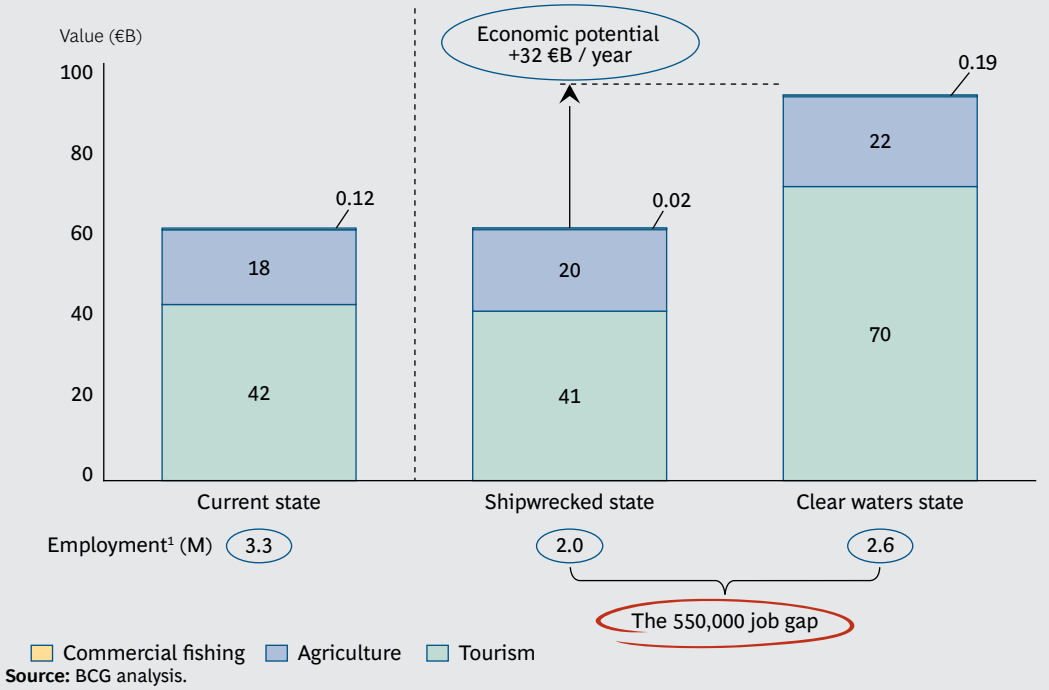
The potential effects of the two scenarios on the Baltic Sea region are substantially different. The clear waters state has an economic potential €32 billion higher than that of the shipwrecked state (see Exhibit 10) and could possibly result in 550,000 more jobs in the future, a number equivalent to 1 percent of the region's total labor supply. The scenarios clearly show how the Baltic Sea's health is not only an environmental concern but also an important economic and social one.

Also, because industries vary in how they affect or are affected by the health of the Baltic Sea and there is strong interdependence among sectors, costs and benefits cannot be analyzed in silos. Instead, a broad, multi-industry approach is needed when defining sustainable solutions for the region.

NOTES

1. Swedbank.
2. Baltic Institute of Marketing, Transport and Tourism.
3. WWF Baltic Ecoregion Programme: "Future Trends in the Baltic Sea" (2010).
4. WWF Baltic Ecoregion Programme: "Counter Currents: Scenarios for the Baltic Sea Towards 2030" (2012).
5. The ecological footprint is an indicator that measures human impact on nature.
6. Swedish Environmental Protection Agency.
7. All employment projections in this report are based on value added but conducted with respect to capacity increases.
8. The amount includes European Fisheries Fund financing, additional state aid, and other related costs (for instance, control and management).
9. The estimate is based on input from the Swedish Environmental Protection Agency and the report "FishSTERN" (2011).
10. This statement includes the assumption that output has risen dramatically but is also based on a reduction of today's assumed 40 percent overcapacity.

EXHIBIT 10 | Total Potential Between Scenarios Varies Significantly



Source: BCG analysis.

TARGET STATE

WHAT COULD THE FUTURE of the Baltic Sea region look like? The Baltic Sea could be healthy and its development sustainable. Environmental challenges could be transformed into competitive business opportunities and the solutions could become global exports. But all of this requires an integrated cross-sectoral and cross-governmental approach and an inspiring vision shared by all stakeholders. Also, the vision must encompass economic and social considerations along with the environmental ones.

An Integrated Approach and a Vision Shared by All

Because sectors in the Baltic Sea region are strongly interdependent, there is a clear need for broader cross-sectoral and cross-governmental engagement in decisions influencing the future trajectory of the Baltic Sea. In other words, the state of the Baltic Sea and the region should not be the domain solely of the environmental sector and ministers, but must concern other sectors and ministries as well, including finance, enterprise, and labor, plus prime ministers. For the approach to succeed, all these sectors must share the same vision and overall goals and work in an integrated way toward them.

To ensure sustainable development in the Baltic Sea region, a strong vision or target state is needed to set the direction and guide actions. Success requires a broad perspective, so the vision must be shared by and inspiring to all stakeholders—including civil society and the public and private sectors. The vision should encompass not only environmental but also social and economic factors and focus on closing the environmental deficit as well as increasing the pace of innovation and commercialization to achieve this. Three pillars emerge as part of a proposed target state:

> The Baltic Sea's health should not be the domain solely of the the environmental sector.

- The Baltic Sea is home to a healthy and robust ecosystem.
- Industries connected to the Baltic Sea are both competitive and sustainable.
- Regional solutions to the challenges in the Baltic Sea have global relevance and therefore significant commercial potential.

If these components are included in the region's vision, it has the potential to be inspiring to relevant stakeholders within governments, across industries, for the public, and in the business community.

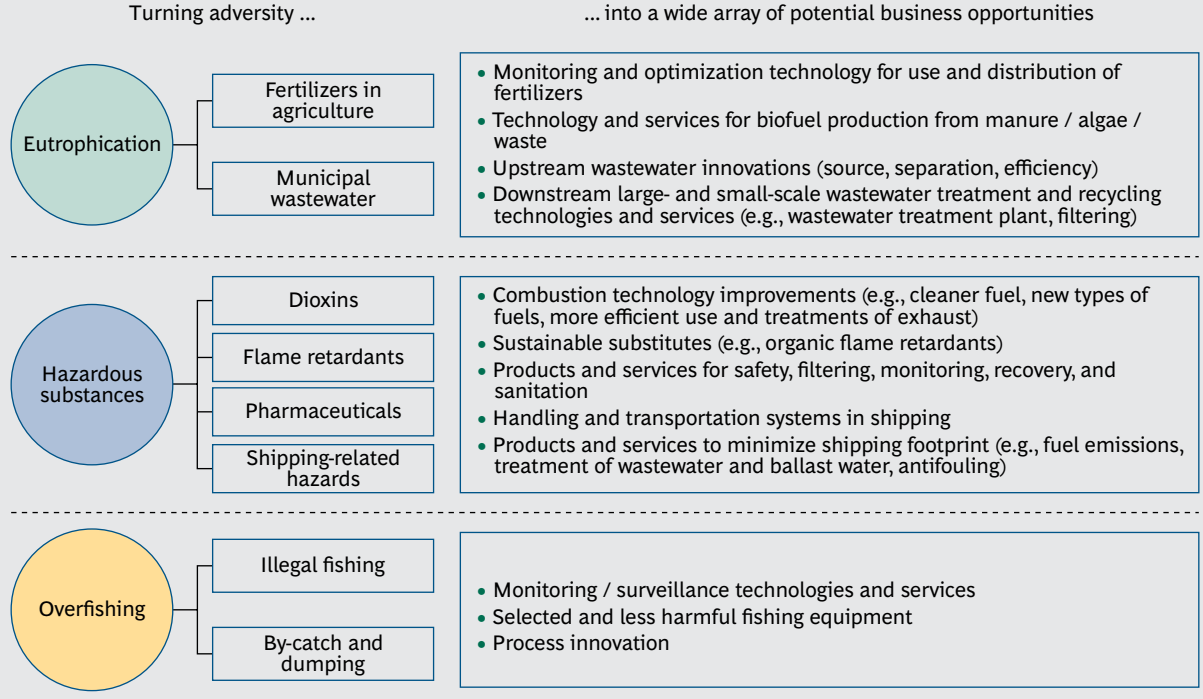
From Challenges to Business Opportunities

As the global challenges of eutrophication, hazardous substances, and overfishing are intensifying, so is the international demand for blue and green solutions. Wastewater treatment, for example, is a growth area. China plans to invest €43 billion over five years to improve urban wastewater infrastructure in response to the fact that 42 percent of China's rivers can be used only for industrial purposes and 22 percent of the rivers are not suitable for human use at all.[1] Similarly, 80 percent of India's sewage flows into rivers and lakes untreated, and the country plans to invest €14 billion in sewage treatment, irrigation, and recycling in the coming five years.[2] The regional demand for improved wastewater treatment in the Baltic region is also strong, as countries around the Baltic Sea on average still release 22 percent of their wastewater into the sea untreated.[3]

As mentioned earlier, the Baltic Sea region's innovative power and strong finances have placed it in a better position than most to find solutions to such global problems. One could claim that this advantage gives the region a certain responsibility toward the rest of the world, but it also gives the region a unique chance to showcase transboundary cooperation and explore the commercial openings these challenges can create.

From a business perspective, the environmental challenges provide a long list of commercial opportunities, from developing entirely new products and services to supplying existing ones in more efficient ways or transferring them between countries. (See Exhibit 11.) An opportunity related to eutrophication might be, for example, tailoring distribution of nutrients to individual crops, thereby reducing input cost, increasing yield, and decreasing nutrient flow into the water. Using algae to make biogas has the potential to both remove nutrients that would otherwise end up in the Baltic Sea and solve the challenge of biofuels competing with food production. Issues related to hazardous substances provide incentives to build systems that minimize the use of toxins as well as measuring equipment that improves the safe handling of them. Shipping offers opportunities to develop solutions with higher combustion efficiency, which reduces emissions and costs through lower fuel con-

EXHIBIT 11 | From Baltic Sea Challenges to Business Opportunities



Sources: Expert interviews; BCG analysis.

sumption, and to develop products and services that cut the impact of wastewater as well as ballast and tank water discharges.

The Baltic Sea also provides multiple corporate social responsibility (CSR) opportunities in responding to environmental challenges. Generally, existing CSR agendas are often very fragmented both in terms of topics addressed and target groups selected, and often are not interlinked with the core business.[4] Identifying and recognizing the impact and dependency of the company on the Baltic Sea, and coordinating CSR opportunities around its challenges, can allow for achievement of environmental benefits and business value simultaneously. However, it is of course more beneficial if companies can go beyond CSR initiatives and really capture blue and green opportunities as their core business.

To capture this potential, lessons can be learned from other regions that have successfully developed blue and green technologies. Singapore's journey from water rationing in the 1960s to becoming a commercially viable hydrohub serves as an example of how adversity can be turned into opportunity. (See the sidebar "Singapore Creates a Hydrohub.") Today, Singapore has not only reached the vision of a sustainable water supply; it has also managed to turn environmental solutions into international business opportunities and now exports its water expertise to China and the Middle East, among other places. Around 6,000 jobs have already been created, the number of companies in the industry has doubled to 100 since 2006, and the number of research centers has increased from three to 25.[5] One of the key factors in Singapore's success is the strong cooperation among stakeholders. The

SINGAPORE CREATES A HYDROHUB

Since its independence in 1965, Singapore has worked to become self-sufficient in the production of drinking water, a great challenge given the country's limited size and dense population. In 2006, after water had been identified as a potential growth industry, a national strategy was introduced to make Singapore a global hydrohub by following six key principles (Environment and Water Industry [EWI] Program Office, 2011):

- Coordinate research efforts.
- Link local R&D to international institutions.
- Offer test-bedding opportunities.
- Adopt new technologies early.
- Support marketing of new technologies.
- Groom talent.

In total, the National Research Foundation (NRF) has invested €290 million in development programs for the water industry (EWI Program Office, 2011). The efforts have proved successful, and so far results include these:

- Doubling the number of water sector companies to over 100 (Bloomberg: "Singapore to Meet Water Target Before Deadline," 2012), including stock-listed Hyflux, United Envirotech, SIIC Environment Holdings, Memstar Technology, and HanKore Environment Tech Group
- Capturing more than 100 international water projects worth around €4.7 billion (Reuters: "Singapore's Water Companies Aim to Quench China's $850 Billion Thirst," 2013) and attracting international companies such as GE and Siemens
- Creating approximately 6,000 jobs, and being well on track to reaching the target of 11,000 employed in the water sector by 2015 (Bloomberg, 2012). As a share of the labor force, that would be the equivalent of adding 187,000 new jobs in the Baltic Sea region (World Bank; BCG analysis).

government has worked strategically to foster leading-edge technologies by investing in research and by actively involving and supporting the industry in the search for innovations.

The Baltic Sea region has the capacity to make a journey similar to Singapore's. By leveraging local capabilities and resources to address the adversities the Baltic Sea faces, the region could evolve into an innovation hub for blue and green technologies. Already the region has a platform on which to build, with a number of companies and projects under way. (See Exhibit 12.) By ensuring that technologies, information, and best practices are shared across countries and industry sectors, the region can scale up successful initiatives and take full advantage of the environmental benefits and business opportunities. To succeed, the region also needs to combine strong commitment and strategic investments from all national governments with cutting-edge research and commercial activities from both multinational companies and innovative start-ups. Becoming a blue and green hub and gaining global leadership could generate significant environmental benefits and a long-term competitive advantage, plus the potential to attract international companies and talent.

Seizing this opportunity brings numerous benefits. By remaining passive and not taking advantage of this beneficial position, we run the risk of later having to import costly solutions to environmental issues from other re-

EXHIBIT 12 | Development Under Way—a Small Selection of Initiatives

ALFA LAVAL WALLENIUS WATER

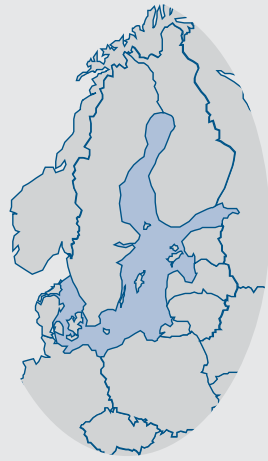
- Alfa Laval and Wallenius Water jointly developed the world's first chemical-free ballast water purification system.

FriGeo

- FriGeo has developed a method to safely remove contaminated sediment by freezing it.
- No risk of releasing hazardous substances or endangering remediation workers.

SOLRØDBIOGAS

- Solrød has a project to produce biogas from locally collected cast seaweed, manure, and industry byproducts.
- Has potential to fulfill 70% of local nitrogen reduction target and 100% of local phosphorus reduction target.
- Makes local beaches more attractive while diminishing the aquatic load of nutrients.



LIQUM

- Liqum provides a single-sensor solution delivering cross-sector water-quality monitoring services that detects up to 80 organic or nonorganic contaminations in real time.
- Customers include water treatment facilities, pharmaceuticals, bio-energy and mining companies.

WÄRTSILÄ

- Wärtsilä solutions include technologies related to efficiency improvement, reduction of emissions, waste reduction, and water treatment.
- Develops both primary and secondary abatement technologies and has broadened the range of usable fuels with strong focus on LNG.

biocentras

- Biocentras has developed a method for removing oil spill and contamination from soil through use of non-genetically-modified bacteria instead of chemicals.

- Fritzmeier has developed an optical sensor for determination of nitrogen content and biomass of crops.
- Measurements of reflected light linked with soil characteristics provide information on plants' ability to uptake nutrients.
- Allows for best distribution of fertilizers to optimize cost performance and grain nitrogen balance.

Sources: Company websites; expert interviews; press search.
Note: Case studies are based on secondary research. LNG = liquified natural gas.

gions. In a highly adverse scenario, solutions are not found and deterioration continues. By turning adversity into opportunity using an integrated approach, a wide range of environmental and social benefits can be achieved and business opportunities simultaneously generated through creation of a dynamic market for blue and green technologies around the Baltic Sea region.

NOTES

1. Center for Science and Environment; China Greentech Initiative; *The Economist*.
2. Bloomberg.
3. HELCOM.
4. BCG project experience; BCG analysis.
5. Environment and Water Industry Program Office (EWI); PUB, Singapore's national water agency.

TURNING THE TIDE

WHAT NEEDS TO HAPPEN to set the Baltic Sea on a positive trajectory? The region needs to prioritize actions, increase accountability, and apply an integrated governance approach. Moreover, commercial incentives should be improved, and the region should invest in developing into a blue and green technology hub. Such changes entail a long-term journey that also requires immediate action and partnership from public and private sectors.

Core Recommendations

1. Focus on key priorities: Because actions are not being systematically prioritized, the risk is that progress will occur where it is easy rather than where it is needed most. A clearly prioritized national and regional agenda, focusing in an integrated manner on high-impact initiatives within the three main problem areas, must be established to address the following key challenges:

- *Eutrophication:* Significantly curtail the leakage of nutrients, provide incentives for reducing use of fertilizers, and improve wastewater treatment plants.

- *Hazardous substances:* Ban the use of toxic substances; form a dynamic approach to handling new, potentially harmful substances; and support development of harmless substitutes for the toxins used today.

- *Overfishing:* Ensure multiannual management plans for all major fish species, find ways to bring the number of unwanted catches and discarded fish toward zero, and limit subsidies to the fishing industry.

2. Increase accountability: Many of the actions to which national stakeholders have consented within the most important agreements and conventions for managing and protecting the Baltic Sea are not being implemented or are behind schedule. Mechanisms to augment accountability locally, nationally, and regionally are needed.

- Countries can support and empower regional bodies like HELCOM to a greater extent in order to enforce implementation of agreed-on actions, independently track progress, and invest from a regional instead of national point of view.

- Civil society and the public and private sectors must work in partnership to hold national authorities more accountable by increasing public pressure to act and honor their commitments.

3. Take an integrated approach: The governance of the Baltic Sea is too narrowly focused. The Baltic Sea's health is considered primarily the domain of environmental ministries, but as this report shows, that health has significant implications beyond

the environment and thus should be governed in an integrated manner beyond traditional silos.

- Not only must countries and sectors coordinate better to manage the Baltic Sea, but the agenda must also be widened to the public and private sectors, ministers of finance, enterprise and labor, and prime ministers. For the integration to be effective it will need to be reflected regionally within existing governance.

- Defining sustainable solutions for the Baltic Sea region must encompass not only environmental but also social and economic considerations in order to achieve cross-sectoral engagement. In addition, a clear scorecard with broad tracking on progress toward a defined end state is needed.

Five core recommendations have been identified to turn the tide for the Baltic Sea.

4. Create commercial incentives: Today, the lack of empowered regional leadership as well as the subsidies promoting unsustainable business models and time-indefinite exemptions from environmental legislation combine to foster uncertainty. They hinder the development of innovation and the commercialization of ideas and thus need to be changed. In addition, commercial incentives to invest in environmental solutions need to be strengthened.

- Remove or set deadlines for current exemptions and subsidies that hamper demand for new innovative solutions—for example, the EU's continued use of the brominated flame retardant HBCD in insulation, which has been banned in 160 countries.

- Find ways to tie environmental costs closer to their source or origin by, for example, consistently introducing an environmental tax on artificial fertilizers. Use the innovative drive and entrepreneurial power of the market to generate solutions, as does the EU emissions trading system, which aims to reduce industrial greenhouse-gas emissions in a cost-effective manner.

- Harmonize and simplify legislation across the region to enable innovative companies to expand, and devise ways for legislators, environmental scientists, and corporate representatives to collaborate more closely at early stages of policy development. For instance, the creation of a global hydrohub in Singapore has been successful because of a national strategy combining the knowledge and resources of the government, research, education, and the business sector.

5. Invest to develop the region into a blue and green technology hub: Many of the more mature economies around the Baltic Sea face a systemic challenge in growing small- and medium-sized enterprises into larger enterprises.[1] By raising the rate of innovation and of commercialization of ideas in the region, this challenge can be addressed and a successful technology hub can be built.

- Create vibrant markets by combining strong commitment and strategic investments from all national governments with cutting-edge research and commercial activities from both multinational companies and innovative start-ups.

- Explore private-public partnerships for leveraging financial resources and knowledge while sharing the risks. Find ways to support commercialization of research and promote venture capital involvement.

- Use public procurement to stimulate innovation by specifying levels of performance or functionality that are not achievable with noncustomized solutions and by including impact on the Baltic Sea as a parameter in general procurement.

- Explore commercial opportunities to develop new products or services addressing environmental challenges by ensuring both efficient use of national expertise

and cross-border sharing of ideas and best practices.

- Capture knowledge gained from other regions that have succeeded in creating blue or green technology hubs.

Near-Term Challenges

Success will hinge on near-term actions by all stakeholders around the Baltic Sea. Public and private sectors must start working toward solid partnerships to ensure change. We propose four specific challenges for different stakeholder groups as a way to start implementing the key recommendations and accelerate change.

1. To the nine costal countries around the Baltic Sea: A broad and integrated perspective is needed for a healthy Baltic Sea, not only to benefit the environment but also for the region's social and economic development. A new or extended vision for the Baltic Sea region is required, potentially overseeing elements such as the environment, energy, security, and global competitiveness.

- **Challenge:** Develop a new or extended vision for the Baltic Sea region encompassing environmental, social, and economic aspects. Define a target state and the main strategic initiatives needed to reach it.

2. To the major political parties: The Baltic Sea's health is too important, and its implications for employment possibilities and the overall economy too great, to be left only to the traditional green parties.

- **Challenge:** Define and present your view of the Baltic Sea target state and what reforms you will seek to achieve it.

3. To the business community: The private sector can play a more constructive role in steering the Baltic Sea into a positive trajectory. There are also significant business opportunities along the way, both regionally and globally.

- **Challenge:** Define the link between your company's core business and the health of the Baltic Sea to identify blue and green business opportunities and potential for focused CSR initiatives.

4. To the media: The current debate about the actions needed to turn the tide in the Baltic Sea is often focused on the perceived nonfeasibility of proposed measures. Little room is left for establishing common ground supporting a target state to which all can aspire, or for finding constructive ways of achieving this state. In addition, the fact that the health of the Baltic Sea is a multidimensional concern is often not recognized.

- **Challenge:** Track and debate the Baltic Sea's environmental, social, and economic progress. Observe all stakeholders and their role in change. Provide space to highlight positive development.

Note
1. Orbis; BCG analysis.

CLOSING THOUGHTS

THIS REPORT'S PRIMARY OBJECTIVE has been to give a picture of the current state of the Baltic Sea, its uncertain future, and a vision of what it could be that is inspiring within governments, across industries, and in the business community. A central theme has been to turn adversity into opportunity by defining a desired target state that can generate more momentum toward a better future for the Baltic Sea region and all its inhabitants.

As illustrated here, the Baltic Sea region is uniquely situated, having better prerequisites than most other regions to address the existing challenges, and there is a global market for the innovations and solutions created by doing so. The potential to create 550,000 more jobs in the future clearly demonstrates that the health of the Baltic Sea is not only an environmental concern but an important economic and social one as well and thus should be governed and managed by securing the attention of finance, enterprise, labor, and prime ministers, in addition to that of environmental ministers.

The Baltic Sea is an amazing asset, be it for food, energy, transportation, or recreation. Historically it has played an important role in shaping the countries around it, and for better or worse it will continue to play a major role in our collective future. All of us living in the region now have the possibility of shaping that future for the coming decades. Not only can we secure the Baltic Sea's health so that it can continue to deliver the ecosystem services we rely on today, but we can also secure its place as a source of innovation and global competitiveness and something that further unites all the countries around it.

What a fantastic opportunity and responsibility: to be the first generation that leaves the Baltic Sea in a better state than we inherited it and to ensure that the legacy is upheld for all generations to come. Simply put, it is time to turn the tide.

FOR FURTHER READING

Key reports referred to and used as sources herein can be obtained from the following Web pages:

"Future Trends in the Baltic Sea" (2010)
WWF Baltic Ecoregion Programme
http://wwf.panda.org/what_we_do/where_we_work/baltic/publications/?194764/Future-trends-in-the-Baltic-Sea

"WWF Counter Currents: Scenarios for the Baltic Sea Towards 2030" (2012)
WWF Baltic Ecoregion Programme
http://wwf.panda.org/what_we_do/where_we_work/baltic/publications/?206013/WWF-Counter-Currents---Scenarios-for-the-Baltic-Sea-Towards-2030

"Baltic Sea Action Plan—Is It on Track?" (2013)
WWF Baltic Ecoregion Programme
http://wwf.panda.org/what_we_do/where_we_work/baltic/publications/?209249/Baltic-Sea-Action-Plan---is-it-on-track

EU Strategy for the Baltic Sea Region
For more information and documentation go to http://www.balticsea-region-strategy.eu/

HELCOM Baltic Sea Action Plan (2007)
http://www.helcom.fi/BSAP/ActionPlan/en_GB/ActionPlan/

NOTE TO THE READER

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8/13

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