

## SCOPE

Vigeo Eiris was commissioned to provide an independent opinion on the sustainability credentials and management of the Green Bond (hereafter the "Bond"), Unsecured Corporate Bond No.21, proposed to be issued by Mitsui O.S.K. Lines, Ltd.(the "MOL" or the "Issuer") in September 2018. Our opinion is established according to our Environmental, Social and Governance ("ESG") exclusive assessment methodology, and on the alignment with the International Capital Market's Green Bond Principles (the "GBP").

The opinion is based on the review of the two following components:

- **Issuer:** evaluation of the Issuer's ESG performance, its involvement in potential ESG controversies and controversial activities<sup>2</sup>.
- **Issuance:** analysis of the coherence between the Bond and issuer's sustainability strategy and commitments, and the bond's alignment with GBP and contribution to sustainability.

Vigeo Eiris gathered information from our rating database, the issuer, press content providers and stakeholders, and complemented by interviews with involved departments and managers. Vigeo Eiris has carried out its due diligence from June 15<sup>th</sup> to July 31<sup>st</sup> 2018.

We were able to access all appropriate documents and to speak to all solicited people. We consider that the provided information enables us to establish our opinions with a reasonable level of assurance on their completeness, precision and reliability.

## VIGEO EIRIS' OPINION

**Vigeo Eiris is of the opinion that the Bond considered to be issued by MOL is aligned with the Green Bond Principles.**

**All Eligible Projects to be (re)financed by the Bond are expected to have net positive environmental benefits, with positive contribution to the prevention of air and water pollution, and to the protection of marine biodiversity. Potential alternative fuels and energy to reduce GHG emissions from international shipping include Liquefied Natural Gas (LNG), advanced biofuels, hydrogen, ammonia, electric ships, wind assistance. As of today, although LNG fuel has not the highest reduction potential compare to other alternative fuels and energy, LNG is the best available option for full scale application to reduce emissions in the global shipping industry, especially for long-distance navigation purpose. Propeller Boss Cap Fins (PBCF) is an energy saving device, requiring less power to propel the vessel. However, LNG fuelled vessels and upgraded PBCF's contribution to the energy transition and climate change is considered not substantial given the level of GHG reduction this industry should achieve based on a long-term perspective, although the issuer has formalized an environmental vision and action plan and has set ambitious medium to long-term GHG emission reduction targets toward FY2050. Consequently, we express a moderate<sup>3</sup> assurance on the Issuer's commitments and the Bond's contribution to sustainability.**

- **Issuer:** MOL displays an overall good<sup>3</sup> ESG performance (see Part I).
  - ▶ MOL displays heterogeneous levels of performance on the three ESG pillars: it achieves good performances in the Environment and Social pillars and limited performances in the Governance pillars, although Governance is considered to be good under Japanese standards.
  - ▶ MOL faces occasional allegations regarding Business Behaviour, which level of severity ranges from minor to high. The company is considered to be overall reactive: it reports transparently in almost all cases, cooperates with interested parties or to take corrective actions in some cases.

<sup>1</sup> This opinion is to be considered as the "Second Party Opinion" described by the Green Bond Principles ([www.icmagroup.org](http://www.icmagroup.org)).

<sup>2</sup> The 15 controversial activities analysed by Vigeo Eiris are: Alcohol, Animal welfare, Chemicals of concern, Civilian firearms, Fossil Fuels industry, Coal, Tar sands and oil shale, Gambling, Genetic engineering, High interest rate lending, Military, Nuclear power, Pornography, Reproductive medicine, and Tobacco.

<sup>3</sup> Definition of Vigeo Eiris' scales of assessment is detailed in the Methodology section of this document.

- ▶ Regarding the 15 controversial activities analysed by Vigeo Eiris, MOL has a minor involvement in Fossil Fuels industry.

- **Issuance:** MOL's first Green Bond issuance is considered to be coherent with the company's main sustainability strategic priorities and sector issues and contributes to achieve its sustainability commitments (see Part II).

With regards to Green Bond Framework, we have recommended developing a framework incorporating the Green Bond Principles as well as MOL's strategy for sustainability, in order to formalise the main objectives, commitments and characteristics of the Bond, and making this publicly accessible, in line with the good market practices.

- ▶ The net proceeds of the Bond issuance will be used to finance and refinance six clearly defined Eligible Projects categories, which appear likely to contribute to air and water pollution prevention, and marine biodiversity protection objectives, without significantly contributing to energy transition and climate change mitigation objectives.

We consider that the defined Eligible Projects categories likely to contribute to two United Nations Sustainable Development Goals (UN SDGs), namely: 9. Industry, innovation and infrastructure, and 14. Life below water, and slightly to the UN SDG 13: Climate action.

- The objectives associated with the Ballast Water Management Systems, SOx Scrubber Systems and Wind Challenger Project categories are defined, relevant, measurable and precise.
- The objectives associated with LNG related Projects and Upgraded PBCF categories are defined, measurable, precise but partially relevant as regards to environmental objectives.

Expected environmental benefits will be assessed and quantified by the issuer for all Eligible Projects categories.

We have recommended to report the dates and schedules of (re)financing assets once decided.

- ▶ The governance and the process for the evaluation and selection of Eligible Projects appear to be transparent and relevant. The process relies on explicit eligibility criteria (selection and exclusion). The identification and management of environmental and social risks associated with the Eligible Projects is considered to be good.
- ▶ MOL's rules for management of proceeds are clearly defined and would enable an overall documented and transparent allocation process.

We have recommended to perform an external verification of the allocation of funds and tracking method in line with GBP guidelines.

- ▶ The reporting process and commitments of the issuer are considered to be good, covering the fund allocation and environmental benefits.

We have recommended to make the relevancy of the underlying methodology (the annual impact assumption model) and the reporting metrics verified by an external third-party.

## EXTERNAL REVIEW

MOL's Green Bond issuance is supported by an external review:

- Second Party Opinion – the hereby Second Party Opinion performed by Vigeo Eiris as sustainability consultant – on the sustainability credentials of the Bond, based on pre-issuance commitments and covering all features of the Bond.

No external verification of the tracking of the bond proceeds and the reporting metrics is contemplated, which is an area of improvement.

*This Opinion is valid as of the date of issuance limited to MOL's Green Bond to be issued in September 2018.*

Paris, July 31<sup>st</sup> 2018

A handwritten signature in black ink, appearing to read 'L. Chesne'.

**Laurie CHESNE**  
Head of Sustainable Bond Services

A handwritten signature in black ink, appearing to read 'P. Courtoisier'.

**Paul COURTOISIER**  
Sustainability Consultant

#### **Disclaimer**

Transparency on the relation between Vigeo Eiris and the Issuer: Vigeo Eiris has not executed any consultancy activity for MOL until so far and no established relationship (financial or other) exists between Vigeo Eiris and MOL.

This opinion aims to explain to the issuer why the Green Bond is considered sustainable, based on the information which has been made available to Vigeo Eiris. Vigeo Eiris has neither interviewed stakeholders out of the Issuer's employees, nor performed an on-site audit nor other test to check the accuracy of the information provided by the Issuer. The correctness, comprehensiveness and trustworthiness of the information collected are a responsibility of the Issuer. Providing this opinion does not mean that Vigeo Eiris certifies the materiality, the excellence or the irreversibility of the projects financed by the Green Bond. MOL is fully responsible for attesting the compliance with its commitments defined in its policies, for their implementation and their monitoring. The opinion delivered by Vigeo Eiris neither focuses on financial performance of the Green Bond, nor on the effective allocation of its proceeds. Vigeo Eiris is not liable for the induced consequences when third parties use this opinion either to make investments decisions or to make any kind of business transaction.

The opinion delivered on stakeholder-related ESG controversies is not a conclusion on the creditworthiness of MOL's or its financial obligations. We do not express an opinion as a score when controversial activities, products and services are not prohibited by international standards or treaties. The controversial activities research provides screening on companies to identify involvement in business activities that are subject to philosophical or moral beliefs. The information does not suggest any approval or disapproval on their content from Vigeo Eiris.

Restriction on distribution and use of this Second Party Opinion: The Second Party Opinion is provided by Vigeo Eiris to the Issuer and is only be used by the Issuer. The distribution and publication are at the discretion of the Issuer, submitted to Vigeo Eiris approval.

## DETAILED RESULTS

### Part I. ISSUER

#### Level of MOL's ESG performance

As of July 2018, MOL's overall approach to manage ESG related issues is considered to be good.

[< Table 1 > ESG performance](#)

Domain	Comments	Opinion
Environment	MOL's performance in the Environment pillar is considered good.	
	MOL has a formalised commitment to environmental protection, namely MOL Group Environmental Vision 2030, in which key items such as the medium-long term GHG emissions reduction targets, environmental management action plan and strategies for developing "Environment and Emission Free Businesses" are addressed.	Advanced
	MOL has set group targets for reduction of GHG <sup>4</sup> per transport unit by 25% by 2030 and by 50 % by 2050 compared to fiscal year 2014. According to its roadmap to reduce GHG emissions, MOL is considering to use not only applicable technologies/projects at the present time but also new technologies that are proven to be economically feasible to achieve this goal. Moreover, MOL eyes the possibilities of offsetting GHG emission by developing "Environment and Emission Free Businesses" and radical innovation.	Good
	At MOL the Executive Committee directly oversees planning and promotion of environment-related measures as well as other CSR/ESG related issues. MOL assesses environment-related risks and opportunities involving MOL, identifies the highest-priority issues in the group's environmental management, and sets environmental targets.	Limited
Social	MOL displays an overall good performance in the Social pillar.	
	MOL commits in its Code of Conduct to prevent human rights violations in society and prevent discrimination in the workplace. MOL became the first Japanese shipping company to participate in the United Nations Global Compact in 2005.	Advanced
	MOL has a formal group policy on Human Resource and established global human resource development system. MOL has a formalised commitment to promote health and safety of its employees, which is supported by comprehensive measures, and established Diversity and Healthcare Management Office in 2017.	Good
	Regarding vessel operation safety, MOL conducts a detailed vessel investigation based on a checklist of about 500 items, such as qualifications and career experience of crewmembers, records of the hull's maintenance status, and engine inspection and maintenance records. If they spot an unsafe condition, they make sure the vessel and concerned ship management company take appropriate corrective measures so the ship meets MOL's safety standards.	Limited
	MOL has training centres in eight locations in six countries. These training centres provide a variety of training, ranging from classroom lectures on theory to practice using real engines and various simulators.	
	As for community involvement, MOL provides various programmes globally, with the primal focus on the following three activities: educational activities on the importance of the shipping industry, addressing social issues through added values generated by transport, and supports for disaster-stricken areas.	Weak

<sup>4</sup> Greenhouse Gas: GHG  
Carbon dioxide: CO<sub>2</sub>  
Sulphur oxides: SO<sub>x</sub>  
Nitrogen oxides: NO<sub>x</sub>  
Particulate matter: PM

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Domain	Comments	Opinion
Governance	MOL's performance in the Governance pillar is considered to be limited based on international standards. However, the performance is considered to be above the average compared with other Japanese peers.	Advanced
	In Vigeo Eiris' view, the overall Corporate Governance performance of Japanese companies is inferior to the performance of companies in other countries and regions. However, thanks to several public initiatives, such as the Japan's Stewardship Code in 2014 and The Japan's Corporate Governance Code in 2015, there are some upward trends of Japanese companies' performance.	Good <i>(based on local standards)</i>
	MOL's Corporate Governance performance is in tandem with these developments. MOL established the Nomination Advisory Committee and the Compensation Advisory Committee where external directors hold a majority which are voluntary but an advisory body to the Board. MOL's Board now has three external directors, of which one is a woman. A performance-based stock remuneration plan for directors and executive officers is also introduced.	Limited <i>(based on international standards)</i>
	At MOL it is stipulated that CSR/ESG is one of items that are directly discussed at the executive committee. MOL identified key ESG issues based on SDGs and set mid-term CSR targets and action plans in its management plan.	Weak

**Stakeholder-related ESG controversies**

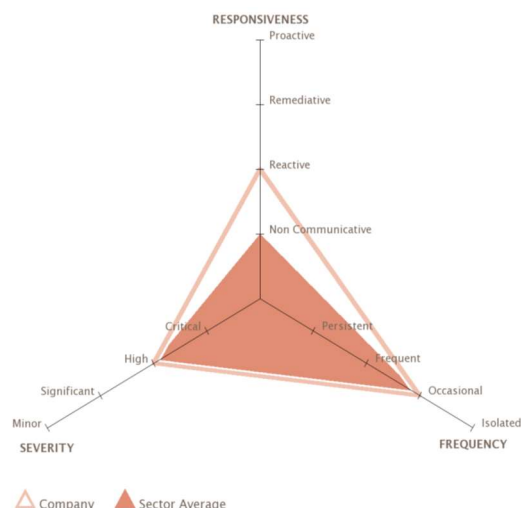
As of July 31<sup>st</sup> 2018, MOL is involved in occasional controversies in the following domains analysed by Vigeo Eiris:

- Business Behaviour: 3 cases related to Prevention of anti-competitive practices.

**Frequency:** On average the frequency of controversies is considered occasional.

**Severity:** The severity ranges from minor (1 case) to high (2 cases). Overall the severity of these events is considered on average high based on the analysis of their impacts on both the company and the stakeholders.

**Responsiveness:** MOL is overall reactive. The issuer fully cooperated with investigation by authorities and explains on its position in two settled cases. Corrective measures on anti-competitive practices are also reported.



**Involvement in controversial activities**

Regarding the involvement in the 15 controversial activities analysed by Vigeo Eiris, MOL has a Minor involvement in Fossil Fuels industry.

- Fossil Fuels industry: MOL's Energy Transport Business segment, which accounted for 16% of the Group's total revenues in FY2017, includes transportation of fossil fuels such as crude oil, LNG and coals. MOL's turnover derived from fossil fuels industries estimated by Vigeo Eiris is less than 10% of the total turnover, therefore the company falls in the category "Minor".

MOL has no involvement in any of the other 14 controversial activities analysed by Vigeo Eiris.

## Part II. ISSUANCE

MOL plans to publicly offer its first Green Bond. With regards to Green Bond Framework, we have suggested developing a framework incorporating the Green Bond Principles as well as MOL's strategy for sustainability, in order to formalise the main objectives, commitments and characteristics of the Bond, and making this publicly accessible. Of note, Vigeo Eiris' Second Party Opinion will be made publicly accessible.

### Coherence of the issuance

#### **MOL's Green Bond issuance is coherent with the company's main sustainability strategic priorities and sector issues and contributes to achieve its commitments.**

According to the International Chamber of Shipping (ICS), the international shipping industry is responsible for the carriage of around 90% of world trade. Shipping is considered the most efficient form of commercial transport compared with other forms of transport such as air flight and truck. However, according to WWF, it is accepted that whilst shipping is relatively safe and clean, compared with other transport modes, the industry does have a significant impact on the environment. In particular, the sector is energy intensive, generating significant environmental impacts from energy use, and continues to be responsible for producing large amounts of greenhouse gas (GHG) emissions (around 2-3% of the world's GHG emissions).

The main sustainability challenges of the shipping industry are the energy efficiency, the reduction of emissions related to energy use, the eco-design strategy to reduce environmental impacts of the vessels and the integration of environmental and social factors in the supply chain.

The industry's efforts to reduce emissions related to energy use in the short term has been rather limited at whole sector level, which is partly due to few technological options available for full scale application to replace Heavy Fuel Oil (HFO). However, in April 2018, the International Maritime Organization (IMO) adopted an initial strategy for the reduction of GHG emissions from ships, with the target of reducing the total annual GHG emissions by at least 50% by 2050, compared to 2008. Besides, the IMO will start to implement a 0.5% Sulphur cap on marine fuel from 2020.

MOL has a formalised commitment to environmental protection, namely MOL Group Environmental Vision 2030, in which key items such as the medium-long term GHG emissions reduction targets, environmental management action plan and strategies for developing "Environment and Emission Free Businesses" are addressed.

MOL has set group targets for reduction of GHG per transport unit by 25% by 2030 and by 50 % by 2050 compared to fiscal year 2014. MOL states that these quantitative targets are aligned with a 2°C scenario. In addition, these targets are considered to contribute to the International Maritime Organization strategy to reduce the greenhouse gas emissions of ships adopted on April 13th ,2018

To achieve these goals, MOL is considering to use not only applicable technologies/projects at the present time such as Propeller Boss Cap Fin (PBCF), low-friction hull paint, larger-size hulls, slow steaming but also new technologies that are proven to be economically feasible such as LNG-fuelled vessels, main engine waste heat recovery, Power Assist Sail (Sailing rigs that provide supplementary propulsion force for the vessel by using the lift force of crosswinds, similar to the wings of an airplane, and drag from tailwinds),etc. Moreover, MOL eyes the possibilities of offsetting GHG emission by developing "Environment and Emission Free Businesses" and radical innovation.

MOL's environmental management action plan, which consists of 18 items, is considered comprehensive and addressing key issues in the shipping sector such as pollution prevention and protection of biodiversity. MOL has been making efforts to ensure compliance with a broad range of environmental regulations in this sector. Regarding strategies for developing "Environment and Emission Free Businesses", MOL identified renewable energy business, alternative fuel business, CO<sub>2</sub> emissions reduction business and environmental value creation business as business opportunities.

By issuing the Bond, MOL will finance and refinance six Eligible Project categories, namely Ballast Water Treatment Systems, SO<sub>x</sub> Scrubber Systems, LNG Bunkering Vessels, LNG-fuelled vessels, Upgraded Propeller Boss Cap Fins and Wind Challenger Project. Of which, Ballast Water Management Systems and SO<sub>x</sub> Scrubber Systems are considered to contribute to protection of biodiversity and pollution prevention, while LNG Bunkering Vessels, LNG-fuelled vessels, Propeller Boss Cap Fin (PBCF) and Wind Challenger Project are considered to contribute to climate change mitigation and to achieve the above-mentioned quantitative targets as well as protection of biodiversity and pollution prevention.

#### Use of proceeds

**The net proceeds of the Bond issuance will be used to finance and refinance six clearly defined Eligible Projects categories, which appear likely to contribute to air and water pollution prevention, and marine biodiversity protection objectives, without significantly contributing to energy transition and climate change mitigation objectives.**

- **The objectives associated with the Ballast Water Management Systems, SOx Scrubber Systems and Wind Challenger Project categories are defined, relevant, measurable and precise.**
- **The objectives associated with LNG related Projects and Upgraded PBCF categories are defined, measurable, precise but partially relevant with regards to environmental objectives.**

**Expected environmental benefits will be assessed and quantified by the issuer for all Eligible Projects categories.**

The net proceeds of the Green Bond will be used to finance and refinance, in whole or in part, the following six Eligible Project categories:

- Ballast Water Management Systems
- SOx Scrubber Systems
- LNG Bunkering Vessels
- LNG-fuelled Vessels
- Upgraded Propeller Boss Cap Fins
- Wind Challenger Project

MOL is committed to ensure the financed vessels will not be used to transport products that relate to controversial activities, namely Alcohol, Animal Welfare, Chemicals of concern, Civilian firearms, Fossil Fuels, Coal, Tar sands and oil shale, Genetically Modified Organisms, Military firearms, Nuclear Power, Pornography, Reproductive Medicine and Tobacco.

Eligible Projects are located in mainly Japan and include:

- Refinancing of existing projects, meaning projects that have been financed within the past 2 years since the bond is issued.
- Financing of ongoing and future projects, meaning projects which operation has not started yet (design or construction stages).

The refinancing rate will be around 50%.

Eligible Projects will contribute to defined objectives, have expected environmental benefits and will meet a set of eligibility criteria defined by the Issuer (Table 2), and which have been assessed by Vigeo Eiris (Table 3).

We have recommended to report the dates and schedules of (re)financing assets once decided.

< Table 2 > Information from MOL

Eligible Projects categories	Definition	Objectives	Sustainability benefits
Ballast Water Treatment Systems	<p>Financing and refinancing Ballast Water Treatment Systems (hereafter "BWTS").</p> <p><i>Ships use ballast water to provide stability during a voyage. Usually seawater is pumped into the tank when cargo is unloaded, and the seawater then discharged at another port when cargo is loaded.</i></p> <p><i>The BWTS is a system that disinfects organisms and pathogens carried out by ballast water. MOL, in cooperation with the manufactures, developed a ballast water treatment system that is in compliance with the IMO regulations.</i></p> <p>Date of the refinanced assets: To be decided within the scope of two-year look back period</p> <p>Schedule: To be decided</p>	Preventing harmful aquatic organisms and pathogens from cross-border transfer by treating 100% of its fleet ballast water	<p>Protection of marine biodiversity</p> <p>---</p> <p>Water pollution prevention</p>
SOx Scrubber Systems	<p>Financing and refinancing SOx scrubber systems.</p> <p><i>SOx scrubber is a system that uses seawater to desulfurize ship exhaust gas in line with the new IMO regulation on sulphurs.</i></p> <p>Date of the refinanced assets: To be decided within the scope of two-year look back period.</p> <p>Schedule: To be decided</p>	Reducing SOx emissions by 86% per vessels compared with non-equipped ships	Air pollution prevention
LNG Bunkering Vessels	<p>Financing LNG bunkering vessels (hereafter "LBV") that uses LNG as fuel.</p> <p><i>LBV are vessels aiming to supply LNG to LNG-fuelled vessels at sea. MOL is building the world's largest LNG bunker vessel, with a capacity of 18,600m<sup>3</sup>.</i></p> <p>Schedule: To be decided</p>	<p>Both directly and indirectly reducing vessels' air emissions of CO<sub>2</sub>, SOx, NOx, PM and total GHG. Reducing vessels' air emissions compared to HFO by approximately:</p> <ul style="list-style-type: none"> <li>- CO<sub>2</sub>: 30% (1,284 mt/vessel/year).</li> <li>- NOx: 76%</li> <li>- SOx: 99%</li> <li>- PM: 100%</li> <li>- Total GHG 15%</li> </ul>	<p>Air pollution prevention</p> <p>---</p> <p>Energy transition</p> <p>---</p> <p>Climate change mitigation</p>
LNG-fuelled Vessels	<p>Financing LNG-fuelled vessels.</p> <p><i>LNG-fuelled vessels use LNG as fuel instead of conventional Heavy Fuel Oil (HFO)</i></p> <p>Schedule: To be decided</p>	<p>Reducing vessels' air emissions compared to HFO by approximately:</p> <ul style="list-style-type: none"> <li>- CO<sub>2</sub>: 30% (11,210 mt/vessel/year).</li> <li>- NOx: 30% for refinanced assets and 86% for financed assets</li> <li>- SOx: 99%</li> <li>- PM: 100% Total GHG: 21%</li> </ul>	<p>Air pollution prevention</p> <p>---</p> <p>Energy transition</p> <p>---</p> <p>Climate change mitigation</p>



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Eligible Projects categories	Definition	Objectives	Sustainability benefits
Upgraded Propeller Boss Cap Fins	<p>Financing Upgraded Propeller Boss Cap Fins (PBCF)</p> <p><i>PBCF rectifies the hub vortex from the blade trailing edge of the boss, eliminates the low-pressure area and reduces the resistance from the Boss Cap fin. The upgraded version of its energy-saving PBCF, which is jointly developed with suppliers, employs a new design that enhances propeller thrust and reduces torque thanks to refinements in fin shape and height.</i></p> <p>Schedule: To be decided</p>	<p>Approximately 5% energy saving effects compared to vessels not equipped with PBCF</p>	<p>Air pollution prevention --- Energy transition --- Climate change mitigation</p>
Wind Challenger Project	<p>R&amp;D expenditures related to the Wind Challenger Project</p> <p><i>The Wind Challenger Project, led by The University of Tokyo, is a research project on wind-propelled ships, which involves using sails as the main driving power, with a propulsion system in an auxiliary role. Launched in September 2009, the project is now developing large-scale solid sail structures using composite materials, as well as examining particulars for vessel designs to develop, and developing fluid analysis techniques and weather routing methods.</i></p> <p>Schedule: To be decided</p>	<p>Aiming at maximum 50% energy saving by equipping large-scale solid sail structures with cargo-carrying vessels</p>	<p>Air pollution prevention --- Energy transition --- Climate change mitigation</p>

< Table 3 > Vigeo Eiris' analysis

Eligible Project categories	Comments
Ballast Water Treatment Systems	<p>The Eligible Project category is clearly defined and aligns with MOL's sustainability strategy.</p> <ul style="list-style-type: none"> <li>- In February 2004 the International Maritime Organization adopted the International Convention for the Control and Management of Ship's Ballast Water and Sediments, aiming to prevent the spread of harmful aquatic organisms from one region to another, by establishing standards and procedures for the management and control of ships' ballast water and sediments. This convention entered into force in September 2017.</li> </ul> <p>The objectives associated with the Eligible Project category are clearly defined, measurable, relevant and precise, with quantified objectives.</p> <p>Expected environmental benefits will be assessed and quantified by the issuer.</p>
SOx Scrubber Systems	<p>The Eligible Project category is clearly defined and aligns with MOL's sustainability strategy.</p> <ul style="list-style-type: none"> <li>- Of note, MOL is committed to install SOx scrubber systems that do not use chemicals to desulfurize ship exhaust gas.</li> </ul> <p>The objectives associated with the Eligible Project category are clearly defined, measurable, relevant and precise, with quantified objectives.</p> <p>Expected environmental benefits will be assessed and quantified by the issuer.</p>

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Eligible Project categories	Comments
LNG Bunkering Vessels	<p>The two Eligible Project categories related to LNG vessels are clearly defined and align with MOL's sustainability strategy.</p> <p>Vigeo Eiris is of the opinion that the two Eligible Project categories related to LNG are relevant with regards to air and water pollution prevention and marine biodiversity objective, but only partially relevant for energy transition and climate change mitigation objectives.</p> <ul style="list-style-type: none"> <li>- Fossil fuels energy, i.e. HFO, is considered to be particularly harmful for the climate.</li> <li>- According to International Transport Forum (ITF), considering the industrial and market needs and technology state-of-the-art, LNG is part of the appropriate technological solutions to transition to a low-carbon activity as of today in the shipping industry, compared with other alternative solutions. The CO<sub>2</sub> mitigation potential of LNG is proven to be substantial with CO<sub>2</sub> reduction of 30% compared to HFO.</li> <li>- However, handling and combustion of LNG involves the release of unburnt methane during bunkering and use phase as well as upstream in the fuel production, processing and transmission, which could diminish its overall environmental advantages depending on the volume of the methane emissions (methane being a very potent GHG).</li> <li>- Considering the potential negative impacts of LNGs due to its methane emissions and the relative CO<sub>2</sub> advantages of other cleaner alternative fuels such as biofuels, LNG might not be an attractive solution for longer term. Consequently, LNG is considered as transitional fuel by relevant experts including the European Commission.</li> </ul>
LNG-fuelled Vessels	<ul style="list-style-type: none"> <li>- In addition, while the individual measures – including alternative fuels such as LNG – can deliver a significant reduction on CO<sub>2</sub> emissions, it is unlikely that one single measure on its own would be the most cost-effective way to achieve objectives such as decarbonisation of shipping by 2035 proposed by ITF. A combination of measures would be needed, which generates different decarbonisation pathways.</li> <li>- MOL's LNG-related projects being expected to reduce GHG emissions by less than 30% (respectively 21% and 15%), the targeted objectives for climate change mitigation and energy transition are not considered significant in terms of the IMO strategy to achieve an absolute reduction in the volume of emissions of at least 50% in 2050 compared with 2008 levels. We consider important to ensure that the Eligible Projects can possibly be converted for the use of alternative fuels in the longer term. In this context, it should be noted that MOL owns three Methanol-fuelled Vessels that are equipped with dual-fuelled, low-rev main engine using methanol and fuel oil.</li> <li>- In addition, fossil fuels energy is an important source of other atmospheric emissions of pollutants and particles. The switch from HFO to LNG demonstrates clear benefits in terms of SO<sub>x</sub>, NO<sub>x</sub> and PM emissions reduction. The targeted objectives for reduction of SO<sub>x</sub>, NO<sub>x</sub> and PM for the Eligible projects are considered significant compared to HFO.</li> </ul> <p>The objectives of the two Eligible Project categories are clearly defined, measurable, precise but partially relevant with regards to environmental objectives. Expected environmental benefits will be assessed and quantified by the issuer.</p>

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Eligible Project categories	Comments
Upgraded Propeller Boss Cap Fins	<p>The Eligible Project category is clearly defined and aligns with MOL's sustainability strategy.</p> <p>The Eligible Project category is partially relevant with regards to pollution prevention, energy transition and climate change mitigation objectives.</p> <ul style="list-style-type: none"> <li>- Fossil fuels energy, i.e. HFO, is considered to be particularly harmful for the climate and is an important source of other atmospheric emissions of pollutants and particles.</li> <li>- Upgraded PBCF is an energy-saving device that contributes to the improvement of the fuel-efficiency from the improved design, leading to expected reduction of GHG emissions and of pollutants and particles emissions.</li> <li>- Upgraded PBCF's expected energy savings effects are around 5% of reduction. The targeted objective for pollution prevention, climate change mitigation and energy transition is not considered significant.</li> </ul> <p>The objectives of the Eligible Project category are clearly defined, measurable, precise but partially relevant with regards to environmental objectives.</p> <p>Expected environmental benefits will be assessed and quantified by the issuer.</p>
Wind Challenger Project	<p>The Eligible Project category is clearly defined and aligns with MOL's sustainability strategy.</p> <ul style="list-style-type: none"> <li>- The Wind Challenger Project aims at maximum 50% energy saving by equipping large-scale solid sail structures with cargo-carrying vessels, based on renewable sources power. Fossil fuels energy, i.e. HFO, is considered to be particularly harmful for the climate and is an important source of other atmospheric emissions of pollutants and particles, and would be reduced to 50%.</li> <li>- This Project clearly contribute to R&amp;D in the shipping sector regarding climate change and energy transition issues.</li> </ul> <p>The objectives associated with the Eligible Project category are clearly defined, measurable, relevant and precise, with quantified objectives.</p> <p>Expected environmental benefits will be assessed and quantified by the issuer based on the progress of the project.</p>

**In addition, Vigeo Eiris considers that the defined Eligible Projects categories are likely to contribute to two UN SDGs, namely: 9. Industry, innovation and infrastructure, and 14. Life below water, and slightly to the UN SDG 13: Climate action.**



*Contribution to achieving the UN SDG 9. Industry, innovation and infrastructure*

The UN SDG 9 consists in building resilient infrastructure, promoting sustainable industrialization and fostering innovation. More precisely, UN SDG 9 targets include to greater adopt clean and environmentally sound technologies.

By using the Green Bond proceeds to finance and refinance defined Eligible Project categories, MOL is contributing to the UN SDG 9, with regards to the above-mentioned target.



*Contribution to achieving the UN SDG 14. Life below water*

The UN SDG 14 consists in conserving and sustainably using the oceans, seas and marine resources. More precisely, UN SDG 14 targets include to prevent and significantly reduce marine pollution of all kinds by 2025.

By using the Green Bond proceeds to finance and refinance defined Eligible Project categories, MOL is contributing to the UN SDG 14, with regards to the above-mentioned target.



*Contribution to achieving the UN SDG 13. Climate action*

The UN SDG 13 consists in taking urgent action to combat climate change and its impacts. The transportation sector plays a key role in investing in systems, institutions and technology to reduce, mitigate or adapt to climate-induced change.

By using the Green Bond proceeds to finance and refinance Eligible Project Categories such as LNG Bunkering Vessels and LNG-fuelled Vessels, MOL is partially contributing to the UN SDG 13, with regards to the above-mentioned contribution.

#### Process for project evaluation and selection

**The governance and the process for the evaluation and selection of Eligible Projects appear to be transparent and relevant. The process relies on explicit eligibility criteria (selection and exclusion).**

MOL's process for projects evaluation and selection is clearly defined and has been formalised below during our due diligence process.

The evaluation and selection process of Eligible projects is based on relevant internal expertise with well-defined roles and responsibilities, and is reasonable structured:

- Finance Division to evaluate and select candidate Green Projects, considering a set of selection and evaluation criteria that is based on MOL's formalised commitment such as MOL Group Environmental Vision 2030, its GHG emission reduction targets, environmental management action plan and strategies for developing "Environment and Emission Free Businesses as well as GBP's broad categories of Green Projects.
- New & Clean Energy Business Division to check and confirm the selected candidate Green Projects are appropriate and eligible considering above the defined criteria and excluding any projects with negative impact which may offset the positive impact.
- More concretely, evaluation and selection of SOx scrubber systems is reported to and approved by the SOx 2020 Regulation Compliance Committee. For the other projects, the Technology Innovation Unit, led by the Chief Technical Officer, is responsible for the approval.
- Explain the selected Green Projects to CFO for the final confirmation.

The verification and traceability are ensured throughout the process by relevant internal documentation and reporting.

- The SOx 2020 Regulation Compliance Committee was held quarterly in FY2017, whereas the BWTS Installation Committee and Technology, Innovation and Environment Committee twice each during the same period. As part of MOL's internal rules, the relevant documentation and reporting rules and procedures are set for these committees as well.

**The identification and management of environmental and social risks associated with the Eligible Projects is considered to be good.**

- At MOL, the Executive Committee directly oversees planning and promotion of environment-related measures. MOL assesses environmental and social risks and opportunities involving MOL, identifies the highest-priority issues in the group's CSR management, and sets targets. These activities also cover environmental and social risks at Eligible Project level as well.
- As for eco-design of vessels, MOL has been making efforts toward safer vessels operation and technologies for reducing environmental impacts on a continuous basis. Currently MOL implements project called ISHIN NEXT, which is MOL's SMART SHIP development project and is based on the success of the precedent Senpaku ISHIN Project announced in 2009.
- During ship construction, MOL continually strives to maintain and improve the quality of all MOL Group-operated vessels in cooperation with shipowners and shipbuilding companies. MOL formulated the first edition of the "MOL Safety Standard Specifications" in the aftermath of serious marine incidents in 2006, and since then has been revising it accordingly.
- MOL has an Operational Safety Committee, chaired by the president. The committee meets bimonthly to deliberate basic policies, countermeasures, and other items related to secure and completely safe operation of MOL Group as a whole. Key performance Indicators (KPIs) such as "Four Zeroes" (zero serious marine incidents, zero oil pollution, zero fatal accidents, and zero serious cargo damage), downtime per ship, incidents per ship resulting in stoppage, Lost Time Injury Frequency are set.
- With regard to vessels' operation safety, MOL implements an investigation by highly skilled ship inspectors. Two ship inspectors, who have a thorough knowledge of MOL's safety standards through onboard experience as a captain or chief engineer, visit ships in person and conduct a detailed investigation based on a checklist of about 500 items, such as qualifications and career experience of crewmembers, records of the hull's maintenance status, and engine inspection and maintenance records. If they spot an unsafe condition, they make sure the vessel and concerned ship management company take appropriate corrective measures so the ship meets MOL's safety standards. MOL also established the Safety Operation Supporting Center (SOSC) which provides 24/7/365 supports for its vessels.

### Management of proceeds

**MOL's rules for management of proceeds are clearly defined and would enable an overall documented and transparent allocation process.**

The allocation of funds to Eligible Projects will be appropriately tracked, managed and recorded by the Finance Division as follows:

- Finance Division is responsible for the management of proceeds. The net proceeds of the Green Bond will be managed by the Finance Division through the internal control systems and be kept in MOL's or group company's account.
- Unallocated funds will be kept in the form of cash or cash equivalents.
- Finance Division will periodically ask each relevant business division to provide information related to fund allocation to check the latest fund allocation situation.
- Finance Division will summarise the information and report it quarterly to the CFO along with unallocated funds situation.

The fund allocation and management processes fall into the scope of the overall corporate external financial audit. We have recommended to perform an external verification of the allocation of funds and tracking method, in line with GBP guidelines.

Funds procured will be fully allocated to the Eligible Projects within 2 years from the bond issuance, in line with market's best practices.

In case of postponement or divestment of projects, the issuer will allocate the proceeds to another Eligible Projects, which will be evaluated and selected based on the formalised decision-making process mentioned above, and make it to the public.

### Reporting

**The reporting process and commitments of the issuer appear to be good, covering the fund allocation and environmental benefits.**

The process for data collection, calculation and reporting are clearly defined.

The responsible division for reporting is specified for each Eligible Project. MOL has an established system to monitor the situation of vessels in operation, which is considered to contribute an appropriate data collection and consolidations. With respect to the SOx scrubber systems and ballast water treatment systems, MOL has internal rules on as well as procurement and installation and will do in the same manner for the other projects.

The reporting process is based on relevant internal expertise such as Finance Division and New & Clean Energy Business Division:

- Funds allocation report:
  - Finance Division will provide the latest funds allocation information approved by CFO to New & Clean Energy Business Division and relevant departments.
  - New & Clean Energy Business Division and/or relevant departments will disclose it.
- Environmental impact report:
  - MOL has an annual impact assumption model which can be applied to each project. Its calculation method will be duly supervised by New & Clean Energy Business Division and Technical Division with their expertise.
  - Finance Division will report the impact for each project using the above-mentioned model multiplied by numbers of the funds allocated vessels or numbers of equipment installed.
  - The responsible business division for each project will provide data and/or information for the calculation to the Finance Division.

MOL will make both reports publicly available on its website annually and until full allocation. MOL will produce a specific reporting in case of material developments.

The selected reporting indicators related to the funds allocation and environmental benefits are relevant to the Eligible Projects Categories. The Issuer commits to report at category level on:

- Use of proceeds (in line with MOL's confidential agreement with its business partners)

< Table 4 > Use of proceeds reporting

Reporting indicators
<ul style="list-style-type: none"> <li>- A brief description of each Eligible Projects category</li> <li>- Usage of the vessels*</li> <li>- Total amount of proceeds allocated aggregated per sub-groups: (in JP¥)</li> <li>- Total amount of unallocated proceeds</li> <li>- Share of refinancing (in %)</li> </ul>

\* the company will report at least that LNG-fuelled vessels will not be used to transport the above-mentioned controversial products. To disclose actual usage is subject to the clients' approval.

MOL will report the details of the fund allocation annually until the net proceeds will be fully allocate and uses sub-groups for the reporting, namely "Regulation response" (Ballast Water Treatment System and SOx Scrubber), "LNG related" (LNG Bunkering Vessels and LNG fuelled vessels), and "Upgraded PBCF and Wind Challenger Project".

- Environmental benefits:

< Table 5 > Environmental reporting

Eligible Projects categories	Reporting indicator at Eligible Project category level
Ballast Water Treatment System	<ul style="list-style-type: none"> <li>- Number of BWTS installed</li> <li>- Volume of treated ballast water (mt/vessel/year)</li> </ul>
SOx Scrubber	<ul style="list-style-type: none"> <li>- Number of systems installed</li> <li>- SOx emission reduction (%) compared to vessels not equipped with the system</li> </ul>
LNG Bunkering Vessels	<ul style="list-style-type: none"> <li>- Number of LBVs financed and entered into operations</li> <li>- GHG emission (mt/vessel/year)</li> <li>- GHG emission reduction (%) compared to HFO vessels</li> <li>- CO<sub>2</sub> emission reduction (%) compared to HFO vessels</li> <li>- NOx emission reduction (%) compared to HFO vessels</li> <li>- SOx emission reduction (%) compared to HFO vessels</li> </ul>
LNG-fuelled Vessels	<ul style="list-style-type: none"> <li>- Number of LNG-fuelled Vessels financed and entered into operations</li> <li>- GHG emission (mt/vessel/year)</li> <li>- GHG emission reduction (%) compared to HFO vessels</li> <li>- CO<sub>2</sub> emission reduction (%) compared to HFO vessels</li> <li>- NOx emission reduction (%) compared to HFO vessels</li> <li>- SOx emission reduction (%) compared to HFO vessels</li> </ul>
Upgraded Propeller Boss Cap Fins	<ul style="list-style-type: none"> <li>- Number of PBCF financed and entered into operations</li> <li>- Energy saving effect (%) compared to vessels not equipped with the device</li> <li>- Avoided GHG emissions (mt/vessel/year)</li> <li>- CO<sub>2</sub> emission reduction (%) compared to vessels not equipped with the device</li> <li>- NOx emission reduction (%) compared to vessels not equipped with the device</li> <li>- SOx emission reduction (%) compared to vessels not equipped with the device</li> </ul>
Wind Challenger Project	<ul style="list-style-type: none"> <li>- Number of Wind Challenger financed and entered into operations</li> <li>- Avoided GHG emissions (mt/vessel/year)</li> <li>- CO<sub>2</sub> emission reduction (%) compared to HFO vessels</li> <li>- NOx emission reduction (%) compared to HFO vessels</li> <li>- SOx emission reduction (%) compared to HFO vessels</li> </ul>

As stated above, MOL has developed the annual impact assumption model which can be applied to each project. When feasible, the Issuer uses actual figures for the environmental impact calculation.

- The underlying assumptions used in the CO<sub>2</sub> emission calculation rely on appropriate external sources.
- We have recommended to make the relevancy of the underlying methodology (the annual impact assumption model) and the reporting metrics verified by an external third-party.

## METHODOLOGY

In Vigeo Eiris' view, Environmental, Social and Governance (ESG) factors are intertwined and complementary. As such they cannot be separated in the assessment of ESG management in any organization, activity or transaction. In this sense, Vigeo Eiris writes an opinion on the Issuer's Corporate Social Responsibility as an organization, and on the objectives, management and reporting of the projects to be (re)financed by this transaction.

Vigeo Eiris' methodology to define and to assess corporate's ESG performance is based on criteria aligned with public international standards, in compliance with the ISO 26000 guidelines, and organized in 6 domains: Environment, Human Resources, Human Rights, Community Involvement, Business Behavior and Corporate Governance. The evaluation framework has been customized regarding material issues, based on the Transport é Logistics Asia Pacific assessment framework, projects specificities and emerging issues.

Vigeo Eiris reviewed information provided by the Issuer, press content providers and stakeholders (partnership with Factiva Dow Jones: access to the content of 28,500 publications worldwide from reference financial newspapers to sector-focused magazines, local publications or Non-Government Organizations). Information gathered from these sources will be considered as long as they are public, documented and traceable. Vigeo Eiris has reviewed documents and websites of the Issuer and interviewed members from several departments of the Issuer.

Our research and rating procedures are subject to internal quality control at three levels (analysts, heads of cluster sectors, and internal review by the audit department for second party opinions) complemented by a final review and validation by the Direction of Methods. A right of complaint and recourse is guaranteed to all companies under our review, including three levels: first, the team linked to the company, then the Direction of Methods, and finally Vigeo Eiris' Scientific Council. All collaborators are signatories of Vigeo Eiris' Code of Ethics.

## Part I. ISSUER

*NB: The Issuer performance, i.e., commitments, processes, results of the Issuer, related to ESG issues have been assessed through a complete process of rating and benchmark developed by Vigeo Eiris Rating (December 2016). Furthermore, this assessment has been completed by Vigeo Eiris Enterprise based on additional public information and stakeholders' views and opinion collected from public documentation.*

### Level of the Issuer's ESG performance

The Issuer has been evaluated by Vigeo Eiris on its Corporate Social Responsibility (CSR) performance, based on 26 relevant ESG drivers organized in the 6 sustainability domains. MOLs performance has been assessed by Vigeo Eiris on the basis of its:

- Leadership: relevance of the commitments (content, visibility and ownership).
- Implementation: coherence of the implementation (process, means, control/reporting).
- Results: indicators, stakeholders' feedbacks and controversies.
- ▶ Scale of assessment of ESG performance: Advanced, Good, Limited, Weak.

### Stakeholder-related ESG controversies and involvement in controversial activities

A controversy is an information, a flow of information, or a contradictory opinion that is public, documented and traceable, allegation against an Issuer on corporate responsibility issues. Such allegations can relate to tangible facts, be an interpretation of these facts, or constitute an allegation on unproven facts.

Vigeo Eiris provides an opinion on companies' controversies risks mitigation based on the analysis of 3 factors:

- Severity: the more a controversy will relate to stakeholders' fundamental interests, will prove actual corporate responsibility in its occurrence, and will have adverse impacts for stakeholders and the company, the highest its severity. Severity assigned at corporate level will reflect the highest severity of all cases faced by the company (scale: Minor, Significant, High, Critical).
- Responsiveness: ability demonstrated by an Issuer to dialogue with its stakeholders in a risk management perspective and based on explanatory, preventative, remediating or corrective measures. At corporate level, this factor will reflect the overall responsiveness of the company for all cases faced (scale: Proactive, Remediate, Reactive, Non-Communicative).
- Frequency: reflects for each ESG challenge the number of controversies faced. At corporate level, this factor reflects on the overall number of controversies faced and scope of ESG issues impacted (scale: Isolated, Occasional, Frequent, Persistent).

The impact of a controversy on a company's reputation reduces with time, depending on the severity of the event and the company's responsiveness to this event. Conventionally, Vigeo Eiris' controversy database covers any controversy with Minor or Significant severity during 24 months after the last event registered and during 48 months for High and Critical controversies.

In addition, 15 controversial activities have been analysed following 30 parameters to verify if the company is involved in any of them. The company's level of involvement (Major, Minor, No) in a controversial activity is based on:

- An estimation of the revenues derived from controversial products or services.
- The precise nature of the controversial products or services provided by the company.

## Part II. ISSUANCE

*The Bond has been evaluated by Vigeo Eiris according to the Green Bond Principles and our methodology based on international standards and sector guidelines applying in terms of ESG management and assessment.*

### Use of proceeds

The use of proceeds guidelines are defined to ensure that the funds raised are used to finance and/or refinance an Eligible Projects and are traceable within the issuing organisation. Each Project endorsed shall comply with at least one of the Eligible Projects category definition in order to be considered as an Eligible Project. Vigeo Eiris evaluates the relevance, visibility, and measurability of the associated environmental and/or social objectives. The sustainability of the Bond is assessed based on the Issuer's commitments and the estimated benefits associated with the Eligible Projects. The contribution of Eligible Projects to sustainable development is evaluated based on the United Nations Sustainable Development Goals.

### Process for project evaluation and selection

The evaluation and selection process has been assessed by Vigeo Eiris regarding its transparency, governance and efficiency. The relevance and exhaustiveness of selection criteria and associated supporting elements, and the coherence of the process are analysed based on material issues considered in Vigeo Eiris' methodology.

### Management of proceeds

The rules for the management of proceeds and the allocation process have been evaluated by Vigeo Eiris regarding their transparency, coherence and efficiency.

### Reporting

Reporting indicators, processes and methodologies are defined by the Issuer to enable annual reporting on fund allocation, environmental benefits (output and impact indicators) and on the responsible management of the Eligible Projects financed by the Bond proceeds, collected at project level and potentially aggregated at Bond level. Vigeo Eiris has evaluated the relevance of the reporting framework according to three principles: transparency, exhaustiveness and effectiveness.

- ▶ Scale of assessment for processes and commitments: Weak, Limited, Good, Advanced.

## VIGEO EIRIS' ASSESSMENT SCALES

Performance evaluation		Level of assurance	
Advanced	Advanced commitment; strong evidence of command over the issues dedicated to achieving the objective of social responsibility. Reasonable level of risk management and using innovative methods to anticipate emerging risks.	Reasonable	Able to convincingly conform to the prescribed principles and objectives of the evaluation framework
Good	Convincing commitment; significant and consistent evidence of command over the issues. Reasonable level of risk management.	Moderate	Compatibility or partial convergence with the prescribed principles and objectives of the evaluation framework
Limited	Commitment to the objective of social responsibility has been initiated or partially achieved; fragmentary evidence of command over the issues. Limited to weak level of risk management.	Weak	Lack or unawareness of, or incompatibility with the prescribed principles and objectives of the evaluation framework
Weak	Commitment to social responsibility is non-tangible; no evidence of command over the issues. Level of insurance of risk management is weak to very weak.		





Vigeo Eiris is a global provider of environmental, social and governance (ESG) research to investors and public and private corporates. The agency evaluates the level of integration of sustainability factors into organisations' strategy and operations, and undertakes a risk assessment to assist investors and companies' decision-making.

Vigeo Eiris offers two types of services through separate business units

- ▶ **Vigeo Eiris rating** offers databases, sector-based analyses, ratings, benchmarks and portfolio screening, to serve all ethical and responsible investment strategies.
- ▶ **Vigeo Eiris enterprise** works with organisations of all sizes, from all sectors, public and private in order to support them in the integration of ESG criteria into their business functions and strategic operations.

Vigeo Eiris is committed to delivering client products and services with high added value: a result of research and analysis that adheres to the strictest quality standards. Our methodology is reviewed by an independent scientific council and all our production processes, from information collection to service delivery, are documented and audited. Vigeo Eiris has chosen to certify all its processes to the latest ISO 9001 standard. Vigeo Eiris is an approved verifier for CBI (Climate Bond Initiative). Vigeo Eiris' research is referenced in several international scientific publications.

Vigeo Eiris is present in Paris, London, Boston, Brussels, Casablanca, Hong Kong, Milan, Montreal, Santiago, Stockholm and Tokyo and has a team of 200. The agency works with partners through its Vigeo Eiris Global Network.

For more information: [www.vigeo-eiris.com](http://www.vigeo-eiris.com)