

Japan Credit Rating Agency, Ltd. (JCR) announces the following credit rating.

Teollisuuden Voima Oyj (security code: -)

<Affirmation>

Foreign Currency Long-term Issuer Rating: A+
Outlook: Stable

Rationale

- (1) Teollisuuden Voima Oyj (TVO) is a not-for-profit Finnish electricity generation company established by Finnish electricity and industrial companies. It sells the generated power to its six shareholders at cost. It currently operates two nuclear power plants, Olkiluoto 1 and 2 (OL1&2), with a total capacity of 1,780MW. It has also been constructing a new nuclear power plant Olkiluoto 3 (OL3, 1,600MW), which is the first European Pressurized Water Reactor (EPR) in Europe. TVO is run on the so-called "Mankala" principle, a business model unique to joint-venture power generators in Finland. Specifically, while the shareholders retain the right to receive the generated power at cost price based on each shareholding ratio, they are obliged to pay, regardless of the receipt of power, the fixed cost including installments and interest payments on the loans of the company falling due annually. The shareholders' commitment to TVO remains solid, as demonstrated in their representation in the company's board and the provision of shareholders' subordinated loans. Moreover, even if shareholders failed to pay, TVO would be able to recover the cost by selling the power given that the average market prices in Finland are currently higher than the production cost. Such business model is an important supporting factor for TVO's rating as it contributes to containing its business and financial risks. The rating is also supported by the important role TVO assumes as a power company that provides nearly 20% of the country's total electricity consumption, and its good track records of operating nuclear power plants.
- (2) The prospective start of commercial operation of OL3 has been further postponed by fourteen months since JCR's last rating review on TVO, and is now scheduled for March 2021. However, the settlement agreement reached in March 2018 between TVO and Areva-Siemens consortium, OL3's turn-key-contractors, for the arbitration proceeding concerning the delay of the project obliged the supplier consortium to secure adequate necessary financial, technical and human resources to complete the project. JCR therefore holds that, even if the completion of the OL3 project is further delayed, the risk of TVO's financial burden further increasing and its production cost significantly rising from the current estimate is low. Based on the agreement, TVO is also entitled to receive a penalty of maximum EUR400 million if the supplier consortium fails to complete the OL3 project by the end of 2019. Taking these into consideration, JCR has affirmed TVO's rating with Stable outlook.
- (3) TVO's production cost stays below the Nordic electricity market Nord Pool's Finland area prices. In 2018, the market prices surged to EUR47/MWh from EUR33/MWh due partly to low hydro power production. However, the average selling price of the power generated by TVO operating at cost price stayed slightly higher than EUR20/MWh. Once OL3 comes into operation, the company's average production cost may go up to around EUR30/MWh as depreciation of the OL3 construction cost will start. However, it is not envisaged that the market prices in Finland will significantly fall below TVO's production cost in the near future. This is partly because Finland, a net importer of electricity, cannot import cheaper electricity from abroad above a certain amount due to the limited capacity of cross-border transmission lines. In addition, TVO's production cost is less volatile as compared with the market prices, which JCR sees as an additional value for TVO's shareholders who put priority on stable power supply. JCR will continue to monitor how cost competitiveness of electricity generated by TVO will evolve in relation to the market prices, as a lower margin could reduce TVO's capacity to absorb possible cost overruns or weaken the shareholders' economic incentive to receive electricity from TVO.
- (4) TVO has solid and stable track records of operating nuclear power plants. The combined load factor of OL1&2 had long averaged roughly 90%. Operating licenses of these units were due to expire in end 2018, but an extension of twenty years was approved by the government in September 2018. When OL3 comes on stream, TVO's domestic market share in term of electricity

generation is expected to rise to around 30%, adding to its importance as a major provider of electricity.

Atsushi Masuda, Haruna Saeki

Rating

Issuer: Teollisuuden Voima Oyj

<Affirmation>

Foreign Currency Long-term Issuer Rating: A+ Outlook: Stable

Rating Assignment Date: December 19, 2019

The criteria used for identifying matters which serve as assumptions for the assessment of the credit status, and the criteria used for setting of grades indicating the results of the assessments of the credit status are published as "Types of Credit Ratings and Definitions of Rating Symbols" (January 6, 2014) in Information about JCR Ratings on JCR's website (<https://www.jcr.co.jp/en/>).

Outline of methodology for determination of the credit rating is shown as "JCR's Rating Methodology" (November 7, 2014) and "Electric Power" (April 25, 2016) in Information about JCR Ratings on JCR's website (<https://www.jcr.co.jp/en/>).

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JCR publishes its press releases regarding the rating actions both in Japanese and in English on the same day. In case that it takes time to translate rating rationale, JCR may publicize the summary version, which will be replaced by the full translated version within three business days. (Regarding Structured Finance products, JCR only publicize the summary version in English.)

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Information Disclosure Form

Japan Credit Rating Agency, Ltd.

Disclosure Required by Paragraph (a)(1)(ii) of Rule 17g-7

Issuer:	Teollisuuden Voima Oyj
Rating Publication Date:	December 24, 2019

1

The Symbol, Number, or Score in the Rating Scale used to Denote Credit Rating Categories and Notches and, the Identity of the Obligor or the Identity and a Description of the Security or Money Market Instrument as Required by Paragraph (a)(1)(ii)(A) of Rule 17g-7

- Please see the news release.

2

The version of the procedure or methodology used to determine the credit rating; as Required by Paragraph (a)(1)(ii)(B) of Rule 17g-7

- Please see the news release.

3

The Main Assumptions and Principles used in Constructing the Procedures and Methodologies used to Determine the Credit Rating as Required by Paragraph (a)(1)(ii)(C) of Rule 17g-7

- The credit rating methodology assumes, in principle, to be applied to assess the likelihood of a given debt payment in light of its issuer's condition and business environment, etc. in the relevant future. There is certain limitation, however, in the time horizon that the rating foresees.
- The credit rating methodology assumes, in principle, that the factors posted in the below are particularly important for such likelihood to be determined, and that the rating determination is made by evaluating each of them not only quantitatively but also employing qualitative analyses.

A) Business Bases

The likelihood of a given debt payment is highly conditional to its issuer's business bases - how they can be maintained/ expanded into the future and thereby secure earnings and cash flows in adequacy and in a sustainable way.

B) Financial Grounds and Asset Quality

The likelihood of debt payment is highly dependent on the degree of the issuer's indebtedness and loss absorption capacity in terms of equity capital. Also notable is that a financial institution might see a significant loss of financial grounds as a result of changes in value of the assets under its possession.

C) Liquidity Positions

The likelihood of debt payment is highly dependent on the adequacy of the issuer's cash and other sources of repayment (liquidity positions).

D) Related Parties' Status and Stance of Support/ Assistance for the Issuer

The likelihood of debt payment is affected one way or the other by the issuer's related parties such as parent company, subsidiary, guarantor, and the government of the issuer's business domicile, etc. - by their own conditions and/ or position of support/ assistance for the issuer.

E) Order of Seniority in Debt Payment

The likelihood of debt payment can be different between given debts of the same issuer. The likelihood of debt payment for an individual debt is dependent on the issuer's discretion, and/ or its rank relative to other debts of the same issuer in the order of seniority in principal/ interest payment which is determined by design as financial product or by laws, etc.

4 The Potential Limitations of the Credit Rating as Required by Paragraph (a)(1)(ii)(D) of Rule 17g-7

- The credit rating herewith presented by JCR is its summary opinion with regard to the likelihood of given debt payment and hence not necessarily a perfect representation of such likelihood. The credit rating is not intended to estimate the probability of default or the loss on given default, either.
- The objective of the credit rating herewith presented does not include any concerns other than the likelihood of debt payment, such as risks of price changes, market liquidity, etc.
- The credit rating herewith presented is necessary to be reviewed along with possible changes of the issuer of rated objects in its business performance and/ or circumstances which include regulatory environment, and hence subject to possible alteration.

5 Information on the Uncertainty of the Credit Rating as Required by Paragraph (a)(1)(ii)(E) of Rule 17g-7

- The information used for the determination of credit rating as herewith presented is obtained by JCR from the issuer of rated objects and other sources that JCR trusts in terms of accuracy and reliability but possibly contains errors due to human, non-human or other causes. Consequently, the credit rating determined on the grounds of such information does not constitute, explicitly or implicitly, any representation or warrant of JCR on the information itself or any consequences of its use in terms of accuracy, relevance, timeliness, wholeness, market value, or usefulness for any specific purposes.

6 Use of Due Diligence Services of a Third Party in Taking the Rating Action as Required by Paragraph (a)(1)(ii)(F) of Rule 17g-7

- There is no use of any third-party due diligence service in the determination of the credit rating herewith presented.

7 Use of Servicer or Remittance Reports to Conduct Surveillance of the Credit Rating Required by Paragraph (a)(1)(ii)(G) of Rule 17g-7

- There is no use of any servicer or remittance report to conduct surveillance of the credit rating herewith presented.

8 The Types of Data Relied Upon for the Purpose of Determining the Credit Rating as Required by Paragraph (a)(1)(ii)(H) of Rule 17g-7

- The information posted in the below, which includes data, is used for the determination of the credit rating herewith presented.

A) Audited financial statements presented by the rating stakeholders

B) Explanations of business performance, management plans, etc. presented by the rating stakeholders

9 Overall assessment of the Quality of Information Available and Considered in Determining the Credit Rating as Required by Paragraph (a)(1)(ii)(I) of Rule 17g-7

- JCR holds its basic policies for securing the quality of information as a base of due diligence for the determination of credit ratings. The information used as a base for the determination of credit rating herewith presented satisfies such policies, which include the audit by an independent auditor, the publication by the issuer or some independent media or, otherwise, JCR analyst's scrutiny, etc.
- JCR sees no particular weakness in the quality of information used for the determination of the credit rating herewith presented as compared to the information used in other cases of the credit rating for comparable issuers or ratable objects.

10 Information Relating to Conflicts of Interest as Required by Paragraph (a)(1)(ii)(J) of Rule 17g-7

- JCR receives payment of compensation for the determination of the credit rating herewith presented from either one of those parties who are issuer, underwriter, depositor or sponsor.
- JCR did not receive in the last fiscal year in the past payment of compensation from the same party for any kind of JCR's service other than the determination of credit rating, such as one in the ancillary business.

11 Explanation or Measure of the Potential Volatility of the Credit Rating as Required by Paragraph (a)(1)(ii)(K) of Rule 17g-7

A) Business Bases

The credit rating is subject to alteration if there is improvement or deterioration of the issuer's business bases, since its revenue, etc. may improve or deteriorate by the change in its business management policies, clients' preferences, competitive situation, or a technological innovation. The resultant alteration of the credit rating is usually by a notch, with possibility of a few notches if and when the change in the business bases is large.

B) Financial Grounds and Asset Quality

The credit rating is subject to alteration if the issuer increases/ decreases its debt/ capital or vice versa and thereby makes its individual debt payment liability less or more bearable and its loss absorption capacity into the future decreased or increased. Also, the changes in the quality of asset under the issuer's holding may affect the credit rating, since such changes could raise or lower the likelihood of future loss of the issuer's financial grounds. The resultant alteration of the credit rating is usually by a notch, with possibility of a few notches if and when the change in the financial grounds and/ or asset quality is large.

C) Liquidity Positions

The credit rating is subject to alteration if there is a change in the issuer's financial management policy or in the relations with fund procurement sources and the change thereby makes its liquidity positions improve or deteriorate. The resultant alteration of the credit rating is usually by a notch, with possibility of a few notches if and when the change is large.

D) Related Parties' Status and Stance of Support/ Assistance for the Issuer

The credit rating is subject to alteration if there is a change in the issuer's parent company or subsidiary, guarantor or other provider of credit enhancement, or the government of the issuer's

business domicile, or other related parties' own conditions and/ or position of support/ assistance for the issuer, and the change thereby makes its business bases, financial grounds and/ or liquidity positions improve or deteriorate, and/ or making the effectiveness of guarantee and other credit enhancement improve or deteriorate. The resultant alteration of the credit rating is usually a notch, with possibility of a few notches if and when the change is large.

E) Order of Seniority in Debt Payment and Non-Payment Forgiven by Contract

The credit rating is subject to alteration if there is a change in the rated debt's status in the order of seniority relative to other debts caused by the improvement/ deterioration of the issuer's financial condition. The resultant alteration of the credit rating is usually a notch, with possibility of a few notches if and when the change is large. Also, in case of the financial products for which non-payment of interest/ principal is contractually permissible, the credit rating is subject to alteration if and when the likelihood of such non-payment is projected to increase or decrease. The resultant alteration of the credit rating could be by a notch but often as much as a few notches.

F) Rise and Fall in General Economy and Markets

The credit rating is subject to alteration if there is a rise/ fall in the general economy and/ or the markets inducing the issuer's revenues/ expenses to increase/ decrease and vice versa, etc. The resultant alteration of the credit rating is usually by a notch, with possibility of a few notches if and when the change is exceptionally large.

G) Various Events

The credit rating is subject to alteration on occurrence of various events, such as change in the issuer's major shareholders, M&A and other organizational change, accident, violation of the law, litigation, legal/ regulatory change, natural disaster, etc., which are unforeseeable at the time when the credit rating is determined, causing a significant change on the issuer's business bases, financial grounds, etc. The resultant alteration of the credit rating could be by a notch but more often than not as much as a few notches.

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Information on the Content of the Credit Rating, Including the Historical Performance of the Credit Rating and the Expected Probability of Default and the Expected Loss in the Event of Default as Required by Paragraph (a)(1)(ii)(L) of Rule 17g-7

- Historical records of the credit rating herewith presented are posted in the end of this paper.
- The credit rating herewith presented by JCR is its summary opinion with regard to the likelihood of given debt payment and hence not necessarily a perfect representation of such likelihood. The credit rating is not intended to estimate the probability of default or the loss on given default, either.
- Facts of the probability of default are posted as Form NRSRO Exhibit 1 on the JCR website under the URL:

<https://www.jcr.co.jp/en/service/company/regu/nrsro/>

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Information on the Sensitivity of the Credit Rating to Assumptions Made as Required by Paragraph (a)(1)(ii)(M) of Rule 17g-7

A) Business Bases

The credit rating herewith presented could be changed if and when the assumptions made at the time of its determination turn out to be inaccurate with regard to the issuer's business bases and powers of earning or cash flow generation, etc. The resultant change of the credit rating is most likely by a notch, as JCR speculates, but possibly as much as a few notches if the development is rapid in improvement or deterioration of the issuer's business bases on some drastic change in the operational environments, etc.

B) Financial Grounds and Asset Quality

The credit rating herewith presented could be changed if and when the assumptions made at the time of its determination turn out to be inaccurate with regard to the issuer's financial grounds and asset quality. The resultant change of the credit rating is most likely by a notch, as JCR speculates, but possibly as much as a few notches if the development is rapid in improvement or deterioration of the issuer's financial grounds and/ or asset quality on some drastic change in its business bases.

C) Liquidity Risks

The credit rating herewith presented could be changed if and when the assumptions made at the time of its determination turn out to be inaccurate with regard to the issuer's liquidity positions. The resultant change of the credit rating is most likely by a notch, as JCR speculates, but possibly as much as a few notches if the development is rapid in improvement or deterioration of the issuer's liquidity positions on some drastic change in its financial management policy or relations with fund procurement sources, etc.

D) Related Parties' Status and Stance of Support/ Assistance for the Issuer

The credit rating herewith presented could be changed if and when the assumptions made at the time of its determination turn out to be inaccurate with regard to the issuer's parent company or subsidiaries, guarantor or other providers of credit enhancement, the government of the issuer's business domicile or other related parties' status and stance of support/ assistance for the issuer. The resultant change of the credit rating is most likely by a notch, as JCR speculates, but possibly as much as a few notches if there is a major change on the part of related parties, such as replacement, disappearance, some drastic improvement/ deterioration of financial grounds/ balances, etc.

E) Rise and Fall in General Economy and Markets

The credit rating herewith presented could be changed if and when the assumptions made at the time of its determination turn out to be inaccurate with regard to the prospects of general economy and markets. JCR expects the change should be most likely by a notch but could be as much as a few notches, should the economy or the markets change so greatly.

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Information on the Representations, Warranties, and Enforcement Mechanisms of an Asset-backed Security as Required by Paragraph (a)(1)(ii)(N) of rule 17g-7

- The credit rating herewith presented is not for an ABS product, and hence no relevant issue.

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The Historical Performance of the Credit Rating

Issuer Name	Issue Name	Publication Date	Rating	Outlook/Direction
Teollisuuden Voima Oyj	Issuer(Long-term)(FC)	March 6, 2003	AA	
Teollisuuden Voima Oyj	Issuer(Long-term)(FC)	January 14, 2004	AA	
Teollisuuden Voima Oyj	Issuer(Long-term)(FC)	November 19, 2004	AA	
Teollisuuden Voima Oyj	Issuer(Long-term)(FC)	December 19, 2005	AA	Stable
Teollisuuden Voima Oyj	Issuer(Long-term)(FC)	February 14, 2007	AA	Stable
Teollisuuden Voima Oyj	Issuer(Long-term)(FC)	January 15, 2008	AA	Stable
Teollisuuden Voima Oyj	Issuer(Long-term)(FC)	January 21, 2009	AA	Stable
Teollisuuden Voima Oyj	Issuer(Long-term)(FC)	January 7, 2010	AA	Stable
Teollisuuden Voima Oyj	Issuer(Long-term)(FC)	February 4, 2011	AA	Stable
Teollisuuden Voima Oyj	Issuer(Long-term)(FC)	December 27, 2011	AA	Stable
Teollisuuden Voima Oyj	Issuer(Long-term)(FC)	February 18, 2013	AA	Stable
Teollisuuden Voima Oyj	Issuer(Long-term)(FC)	March 28, 2014	AA	Negative
Teollisuuden Voima Oyj	Issuer(Long-term)(FC)	January 21, 2015	AA-	Stable
Teollisuuden Voima Oyj	Issuer(Long-term)(FC)	February 17, 2016	AA-	Stable
Teollisuuden Voima Oyj	Issuer(Long-term)(FC)	December 9, 2016	AA-	Stable
Teollisuuden Voima Oyj	Issuer(Long-term)(FC)	February 6, 2018	A+	Stable
Teollisuuden Voima Oyj	Issuer(Long-term)(FC)	December 17, 2018	A+	Stable

Attestation Required by Paragraph (a)(1)(iii) of Rule 17g-7

I, Atsushi Masuda, have responsibility to this Rating Action and to the best of my knowledge:

- A) No part of the credit rating was influenced by any other business activities.
- B) The credit rating was based solely upon the merits of the obligor, security, or money market instrument being rated.
- C) The credit rating was an independent evaluation of the credit risk of the obligor, security, or money market instrument.



Atsushi Masuda
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