

CURRICULUM VITAE

(Up-to-date as of January 31, 2020)

1. PERSONAL INFORMATION

First Name	Middle Name	Last Name	
Shutaro	N/A	Takeda	
Primary Nationality	Other Nationality	Date of Birth (MM/DD/YYYY)	Gender (M/F)
Japan	N/A	05/06/1989	M
Business Address			
International Atomic Energy Agency. Vienna International Centre PO Box 100, 1400 Vienna, Austria			
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2. EDUCATION HISTORY

School	From – To (MM/YY)	Degrees/Diplomas received	Main Fields of Study
Harvard University Extension School	06/2018 – 05/2019	Master of Liberal Arts	Energy Sustainability <ul style="list-style-type: none"> • Environmental Science • Life Cycle Assessment Energy Scenario Analysis <ul style="list-style-type: none"> • Energy Economy • Energy Policy • Carbon Emission Scenarios
Kyoto University Graduate School of Energy Science	04/2016 – 03/2018	Ph.D.	Energy Economics <ul style="list-style-type: none"> • Energy Planning for Fusion Social Acceptance of Nuclear Fusion Energy Nuclear Fusion Engineering <ul style="list-style-type: none"> • Plant Engineering
Kyoto University Graduate School of Advanced Integrated Studies in Human Survivability	04/2014 – 03/2016	Master's Equivalent Certificate	Socio-Economic Assessment of Energy Sources <ul style="list-style-type: none"> • Energy Economics • Social Acceptance
Kyoto University Faculty of Engineering	04/2008 – 03/2014	Bachelor of Engineering	Material Science <ul style="list-style-type: none"> • Energy Material

3. EMPLOYMENT HISTORY

Current Position		
Name of organization	Position/Title	Dates of service
International Atomic Energy Agency	Associate Project Officer	Present

Previous Positions		
Name of organization	Position/Title	Dates of service
Kyoto Fusioneering Ltd.	Co-Founder	10/1/2019 – 12/31/2019

Previous Positions		
Name of organization	Position/Title	Dates of service
Kyoto University	Assistant Professor (Program-Specific)	4/1/2018 – 12/31/2019

(1) Duties

Full-time faculty member of the Graduate School of Advanced Integrated Studies in Human Survivability, Kyoto University.

- **Conduct academic researches** on energy sustainability, energy economy, and renewable energy policy in developing nations.
- **Deliver lectures and seminars** on related topics, including energy scenario analysis, energy policy and nuclear non-proliferation.
- **Attend committee meetings** in the field of energy development policy.
- **Manage cooperative research networks** with external organizations.

(2) Scope of Responsibilities

As a faculty member of Kyoto University, I **supervise seven graduate students** on both Master's and Doctor's levels.

As the **Research Director** of the ERIA-Kyoto University Joint Research Program, I lead an international collaborative research project on renewable energy policy in ASEAN in the aim of expanding electricity access in the region, with the total budget of 181,000 USD (20M JPY).

As the **Project Administrator** of the JICA-Kyoto University Contract Research Project, I administer a contract research on the socio-economic analysis of renewable energies in developing nations, with the total budget of 272,000 USD (30M JPY).

As the **Research Representative** of the Public Outreach Group at the National Institute for Fusion Science, I represent a nationwide initiative on the public outreach activities of nuclear fusion energy.

Appointed part-time as a consultant at Tokamak Energy Ltd. and an advisor at The Sasakawa Peace Foundation (see next items). Also studied part-time at Harvard University toward the Master's degree in Energy Sustainability.

(3) Major Accomplishments

Published several academic papers in *Sustainability*, *Journal of Development Policy and Practice*, *IEEE Transactions on Plasma Science*, and *Transactions of American Nuclear Society*.

Presented at a number of academic conferences including the World Energy Engineering Congress 2018, 91st Center for Advanced Policy Studies Conference, 27th IAEA Fusion Energy Conference, 23rd Topical Meeting on the Technology of Fusion Energy, 6th International Symposium on Human Survivability, among others.

Established global cooperative research networks with international and domestic organizations.

- Negotiated and facilitated the signing of an official research agreement between **Kyoto University and ASEAN Centre for Energy (ACE)**.
- Launched and managed a cooperative research network with the **Economic Research Institute for ASEAN and East Asia (ERIA)** and **Heads of ASEAN Power Utilities/Authorities (HAPUA)**.
- Facilitated a research relationship with the **Japan International Cooperation Agency (JICA)**.
- Launched a joint research project with **Kyushu University and Harvard University**.

Successfully directed an energy strategic planning program, "Renewable Development Strategy for ASEAN 2040: A Dynamic Multilateral Scenario Analysis."

- Consulted Economic Research Institute for ASEAN and East Asia (ERIA) on the renewable energy development policies in ASEAN member states in collaboration with ASEAN Centre for Energy (ACE) and Heads of ASEAN Power Utilities/Authorities (HAPUA).

- Arranged multiple international workshops at Jakarta, inviting policy makers, consultants and industry figures from ASEAN member states and Japan.

Successfully administered an energy scenario analysis project, “A Socio-economic Research on Sustainable Development of Renewable Energy Sources in Developing Countries.”

- Consulted Japan International Cooperation Agency (JICA) on the renewable energy development policies in developing countries in the aim of expanding electricity access in the region.
- Conducted a series of field studies in Indonesia in collaboration with the Ministry of Energy and Mineral Resources of the Republic of Indonesia. Analyzed the Social Life Cycle Assessment of the renewable energy installations.
- Drafted and edited policy proposal reports for JICA and the Ministry of Energy and Mineral Resources of the Republic of Indonesia.

Awarded the International Young Energy Professional of the Year Award by the Association of Energy Engineers (AEE) in recognition for the achievements in energy science.

Previous Position		
Name of organization	Position/Title	Dates of service
Tokamak Energy Ltd.	Consultant (Part-time)	1/1/2019 – Present

(1) Duties

Consult Tokamak Energy Ltd. on the development strategy of their nuclear fusion reactors.

- Provide professional advices on the application of compact Spherical Tokamak reactors as heat sources.
- Propose development scenarios for the process heat application of nuclear fusion toward biomass gasification plant.

(2) Scope of Responsibilities

As an academic consultant, I provide energy scenario analyses and economic assessments directly to the executive vice chairman of the company, Dr. David Kingham.

(3) Major Accomplishments

Drafted a technical assessment report on the company’s fusion development strategy.

- **The report was submitted to the UK Government** by Tokamak Energy Ltd.

Planned and organised an international conference on the commercialization of nuclear fusion at University of Cambridge.

- Invited professionals from both United Kingdom and Japan with EPSRC JUNO Network funding.

Elected as a Fellow of the Royal Society of Arts (RSA) in the United Kingdom for merit in the contribution to the Japan-UK research cooperative relationship in nuclear engineering.

Previous Position		
Name of organization	Position/Title	Dates of service
The Sasakawa Peace Foundation	Advisor (Part-time)	10/1/2018 – 3/31/2019

(1) Duties

Advise The Sasakawa Peace Foundation on the peaceful use of nuclear energy.

- Conduct policy analyses on the proliferation risks of plutonium in Japan.
- Calculate a probabilistic outlook on the Japanese plutonium stockpile until 2050 with Monte-Carlo method.

(2) Scope of Responsibilities

As an advisor, I advise the chairman of The Sasakawa Peace Foundation, Mr. Nobuo Tanaka, for the “New Initiative on the Use of Nuclear Energy and Non-proliferation” project through academic researches.

(3) Major Accomplishments

Established a new probabilistic assessment method for the proliferation risks of future Japanese plutonium balance until 2050.

- The results were briefed to Japanese Cabinet ministers concerned.

- The assessment to be included in the final policy recommendation report to policy-makers and lawmakers published by The Sasakawa Peace Foundation.
 - **Present the findings at academic conferences**, including the 2019 ANS Annual Meeting (Accepted, 2019).
- Publish the findings as a journal paper** in *Transactions of the American Nuclear Society* (In Press, 2019).

Previous Position		
Name of organization	Position/Title	Dates of service
Kyoto University	Research Fellow	4/1/2016 – 3/31/2018

(1) Duties

Full-time researcher at the Institute of Advanced Energy, Kyoto University.

- **Conducted academic researches** on energy economy, and social acceptance of energy sources, nuclear fusion plant engineering, and nuclear fusion strategic planning.
- **Delivered seminars** on related topics, including nuclear fusion plant engineering and social acceptance of nuclear fusion.

(2) Scope of Responsibilities

As a full-time researcher, I **supervised four graduate students** on Master's levels.

Independently conducted a number of academic researches on the socio-economic assessment of energy sources.

Led and administered a research project on social acceptance of energy sources at Kyoto University, with the total budget of 22,600 USD (2.5M JPY).

(3) Major Accomplishments

Published several academic papers in *Fusion Engineering and Design*, *Plasma and Fusion Research*, and *Fusion Science and Technology*.

Presented at a number of academic conferences including the 26th IAEA Fusion Energy Conference, 13th International Symposium on Fusion Nuclear Technology, 27th IEEE Symposium On Fusion Engineering, 29th Symposium on Fusion Technology, 2017 International Congress on Advancements on Nuclear Power Plant, 22nd Topical Meeting on the Technology of Fusion Energy, 11th International Conference on Tritium Science & Technology, among others.

Conducted a series of researches on the energy development strategies of nuclear fusion.

- Analyzed the role of nuclear fusion towards the future energy transition.
- Presented the results at international conferences, including the 26th IAEA Fusion Energy Conference.

Analyzed the social acceptance of nuclear fusion power plants in the future society.

- Assessed the environmental behavior of Tritium release to the ocean.
- Constructed simulation models of a nuclear fusion power plant and an electrical grid. Developed a method to evaluate the adverse effects of nuclear fusion power plants on the power grid stability.
- Assessed the effects of the increase in the future renewable power sources on the nuclear fusion development strategy.

Developed a concept of nuclear fusion plant as a heat source to convert biomass into fuel.

- Designed the nuclear fusion biomass gasification plant concept.
- Conducted environmental Life Cycle Assessment on the concept. Assessed the economic impact of the plant.
- Presented the results at international conferences, including the 2017 International Congress on Advances in Nuclear Power Plants.

Awarded the PhD Poster Prize at 29th Symposium on Fusion Technology at Czech Republic, selected from more than 150 presentations.

One of the papers on nuclear fusion development strategy was selected and **honored as Key Scientific Article by Renewable Energy Global Innovations** (Ontario, Canada).

Awarded the Ph.D. degree in Energy Science by the university for research accomplishments.

Awarded JSPS KAKENHI Grant Number 16J11105 by the Japan Society for the Promotion of Science.

Previous Position		
Name of organization	Position/Title	Dates of service
Japan International Cooperation Agency (JICA)	Japan Overseas Cooperation Volunteer (JOCV)	8/8/2015 – 9/8/2015

(1) Duties

Led a research project in rural Bangladesh to consult the Bangladeshi government on a national development project, "Participatory Rural Development Project Phase-2 (PRDP-2)" as part of Japanese Official Development Assistance (ODA).

- Analyzed the degree of success and the key success factors of PRDP-2 through field interviews.
- **Presented the findings and policy recommendations** to the Bangladeshi government and JICA.

(2) Scope of Responsibilities

Led a survey team of 16 members in the field to successfully accomplish the project within the set timeframe, with the budget of ~362,000 USD (40M JPY).

Presented the findings to the Director General and other officials concerned at the Bangladesh Rural Development Board as **the lead investigator**.

Drafted and published a journal paper as **the first author**.

(3) Major Accomplishments

Quantitatively identified the key success factors of the national project in Tangail area.

- Our policy recommendation was directly delivered to the Bangladeshi government. A successive national project was launched subsequently.
- The findings were published as a journal paper in *Journal of Development Policy and Practice*. (This was the first occasion where a Japan Overseas Cooperation Volunteer project resulted in a journal paper.)

Policy implications were extracted from the quantitative analysis, which were delivered directly to the Director General and other officials concerned at the Bangladesh Rural Development Board

Findings of the survey **received a high praise and attention** from both JICA and the Bangladeshi government.

Contributed to the implementation of the latest national development project "Participatory Rural Development Project Phase-3 (PRDP-3)." Now the Bangladeshi government is **targeting to implement this model to 324,000 villages** nation-wide.

Previous Position		
Name of organization	Position/Title	Dates of service
Japan Ground Self Defence Force	Sergeant First Class	8/20/2011 – 3/31/2014

Served in the Japan Ground Self Defense Force (JGSDF) as a reserve Sergeant First Class for international security-related duties.

- Duty posts include the JGSDF 1st Division Headquarters and the 11th Infantry Regiment.
- Participated in multiple US-Japan bilateral military exercises.

(Details of the duty classified under Self-Defense Forces Act.)

Previous Position		
Name of organization	Position/Title	Dates of service
EMIT Japan Corporation	Programmer	8/1/2009 – 8/1/2011

(1) Duties

Developed and localized an e-learning platform as **a part-time programmer**.

(2) Scope of Responsibilities

As a part-time programmer, I independently developed and localized e-learning software for universities with web-based programming languages, including PHP + MySQL.

(3) Major Accomplishments

Successfully deployed an e-learning software, Sakai, to the Japanese market.

- Sakai was later adopted by multiple universities in Japan including Kyoto University, and is now recognized as one of the leading software in the Japanese market.
- Granted a patent for invention of a data processing algorithm as **Japan Patent No. P5681305**.

4. LANGUAGE SKILLS

Language (List native tongue(s) first)	Reading Excellent/Good/Fair	Writing Excellent/Good/Fair	Speaking Excellent/Good/Fair
Japanese	Excellent	Excellent	Excellent
English	Excellent	Excellent	Excellent

English Test Scores (year the test was taken)		
TOEFL	TOEIC	UN Association's Test of English
110 (2018)	990 (2014)	SA (2017)

5. COMPUTER SKILLS

List computer software with which you are familiar
R MATLAB Stella Professional openLCA Dymola Adobe Illustrator Microsoft Office (Word/PowerPoint/Excel)

6. HONORS/PUBLICATIONS/PROFESSIONAL LICENSES

List scholastic honors, professional societies and activities in civic, public or international affairs and any professional licenses
<p><u>Honors</u></p> <p>Awarded a number of international and national level prizes and honours. Among them:</p> <ul style="list-style-type: none"> • International Young Energy Professional of the Year Award by Association of Energy Engineers (Oct. 2018) • Fellow of the Royal Society of Arts in the United Kingdom (May 2018) • Dean's List of Academic Achievement Award by Harvard University (May 2019, Expected) • Best Presentation Award, First Place at 2015 General Meeting of Atomic Energy Society of Japan (March 2015) • PhD Poster Prize at 29th Symposium on Fusion Technology (Prague, Czech Republic), selected from more than 150 candidates. • AESJ Kansai Region Award at the 11th Atomic Energy Society of Japan Young Researchers' Workshop. • Encouragement Prize at Kyoto University Interdisciplinary Research Ideas Contest 2014. • Member of the National Honor & Merit Scholars honour society (New York, United States). • Key Scientific Article Certificate by Renewable Energy Global Innovations (Ontario, Canada). <p>Passed the entrance examination first on the list for the Graduate School of Energy Science, Kyoto University in 2013.</p> <p>Received Kyoto University GSAIS Full Scholarship between 2014-2016 for academic excellence.</p> <p><u>Publications</u></p> <p>More than a dozen journal articles and conference proceedings in various fields, primarily in nuclear fusion. Among them:</p> <p>Renewable Energy Development in Developing Nations</p>

- Shutaro Takeda, Alexander Keeley, Shigeki Sakurai, Ryota Managi and Catherine Benoit Norris, “Are renewables as friendly to humans as to the environment?: A social life cycle assessment of renewable electricity.” *Sustainability*, 2019. (In Press)

Rural Development

- Shutaro Takeda et al., “The Success of the Link Model Programme in Rural Bangladesh: An Empirical Analysis.” *Journal of Development Policy and Practice*, 2018. 3(2): pp. 191-214.

Energy Economics

- Md Abdullah AL Matin, Shutaro Takeda et al., “LCOE Analysis for Grid-Connected PV Systems of Utility Scale Across Selected ASEAN Countries.” *ERIA Discussion Paper Series*, 2019. (In Press)
- Shutaro Takeda, Shigeki Sakurai and Satoshi Konishi, “Economic Performance of Fusion Power Plant on Future Deregulated Electricity Market.” *Preprint of 27th IAEA Fusion Energy Conference*, 2018. IAEA-CN-258/SEE/3-1Rb.

Energy Scenario Analysis of Nuclear Fusion

- Shutaro Takeda, Shigeki Sakurai, Yasushi Yamamoto, Ryuta Kasada and Satoshi Konishi, “Limitation of Fusion Power Plant Installation on Future Power Grids under the Effect of Renewable and Nuclear Power Sources.” *Fusion Engineering and Design*, 2016. 109-111: pp. 1754-1758.
- Shutaro Takeda, Shigeki Sakurai, Yasushi Yamamoto, Ryuta Kasada and Satoshi Konishi, “Dynamic Simulation-Based Case Study of Fusion on Small-Scale Electrical Grids.” *Fusion Science and Technology*, 2017. 68(2): pp. 341-345.

Energy Strategic Planning of Nuclear Fusion

- Shutaro Takeda, Shigeki Sakurai, Yasushi Yamamoto, Ryuta Kasada and Satoshi Konishi, “Requirements for DEMO from the Aspect of Mitigation of Adverse Effects on the Electrical Grid.” *Plasma and Fusion Research*, 2015. 10: p. 1205070.

Nuclear Fusion Plant Engineering

- Shutaro Takeda, Shigeki Sakurai, Ryuta Kasada and Satoshi Konishi, “Plasma Control Requirements for Commercial Fusion Power Plants: A Quantitative Scenario Analysis With a Dynamic Fusion Power Plant Model.” *IEEE Transactions on Plasma Science*, 2018. 46(5): pp. 1205-1210.
- Shutaro Takeda, Shigeki Sakurai, Ryuta Kasada and Satoshi Konishi, “Environmental Life Cycle Assessment of High Temperature Nuclear Fission and Fusion Biomass Gasification Plants.” *Proceedings of 2017 International Congress on Advances in Nuclear Power Plants*, 2017: p. 17582.

Nuclear Non-Proliferation Policy

- Shutaro Takeda, “Japanese Plutonium Balance Outlook to 2050: A Monte Carlo Approach.” *Transactions of the American Nuclear Society*, 2019. (In Press)
- Shutaro Takeda, Takeshi Sakade and Hideki Iwaki, “A System Dynamics Study on the Prospect of Japanese Plutonium Balance.” *Graduate School of Economics, Kyoto University Discussion Paper*, 2018. No. E-18-002.

(Among others)

Co-authored two textbooks, *Power Plants in the Industry* and *Integrated Studies in Human Survivability (in Japanese)*.

- Shutaro Takeda and Richard Pearson, “Nuclear Fusion Power Plant.” *Power Plants in Industry*, 2019. IntechOpen: London.
- Yuichi Ikeda (ed.), ... Shutaro Takeda et al., “Renewable Energy and the Human Survival (in Japanese).” *Integrated Studies in Human Survivability*, 2019. Kyoto University Press: Kyoto (In Press).

Co-authored three policy recommendation reports.

- *A Policy Recommendation towards a Stable US-JAPAN Nuclear Cooperative Relationship after the Expiration of US-JAPAN 123 Agreements for Peaceful Cooperation*, A Sasakawa Peace Foundation Research, 2019 (In Press).
- *A Socio-economic Policy Recommendation on Sustainable Development of Renewable Energy Sources in Developing Nations*, A Report to Japan International Cooperation Agency: JICA, 2018.
- *A Policy Recommendation on the Role of ASEAN Power Grid on Renewable Energy Development*, A Report to the Economic Research Institute for ASEAN and East Asia: ERIA, 2018.

Published the following theses and dissertations.

- *Biomass Energy Carbon Capture and Sequestration with Nuclear Fusion: A Promising Option for Future Energy Sustainability?*. Master of Liberal Arts Thesis, Harvard University, 2019. (In Press)
- *Technological Acceptance of Nuclear Fusion Power Plants on Future Electricity Markets* (in Japanese). Doctoral Dissertation, Kyoto University, 2018.
- *Impacts of Nuclear Fusion Power Plants on Society: Quantitative Assessment of the Adverse Effects of Sudden Output Interruptions of Fusion Plants*. Master's Dissertation, Kyoto University, 2016.
- *Deformation Behaviour of Fe₂Nb Laves Phase Intermetallic Crystal* (in Japanese). Bachelor's Thesis, Kyoto University, 2014.

Professional Licenses

Professional Certificate in Data Science, Harvard University (Expected May, 2019)

7. TRAINING/CONFERENCES

Delivered Invited Seminars at:

Economic Research Institute for ASEAN and East Asia (ERIA) Special Lecture on "Renewable Energy in ASEAN," Jakarta, Indonesia. (5/16/2018)
ERIA – Kyoto University Special Open Workshop "Renewable Development Strategy for ASEAN 2040," Jakarta, Indonesia. (9/24/2018)
Imperial College London CNE Seminar Series "Let's talk about Fukushima: A Chronology of Japanese Nuclear Research," London, UK. (03/28/2018)

Oral Presentations at International Conferences:

42nd International Association of Energy Economics International Conference, Montreal, Canada (5/29/2019)
2019 American Nuclear Society Annual Meeting, Minneapolis, USA (6/10/2019)
2017 International Congress on Advancements on Nuclear Power Plant, Kyoto, Japan. (4/26/2017)
22nd ANS Topical Meeting on the Technology of Fusion Energy, Philadelphia, USA (8/23/2016)
11th International Conference on Tritium Science & Technology, Charleston, USA. (4/21/2016)
12th International Symposium on Fusion Nuclear Technology, Jeju, Korea. (9/14/2015)
26th IEEE Symposium on Fusion Engineering, Austin, USA. (6/4/2015)
21st ANS Topical Meeting: Technology of Fusion Energy, Anaheim, USA. (11/12/2014)

Poster Presentations at International Conferences:

27th IAEA Fusion Energy Conference, Ahmedabad, India. (10/26/2018)
23rd ANS Topical Meeting on the Technology of Fusion Energy, Orlando, USA (10/13/2018)
Royal Society Meeting: Fusion energy using tokamaks: can development be accelerated?, London, UK. (3/26/2018)
13th International Symposium on Fusion Nuclear Technology, Kyoto, Japan. (9/25/2017)
27th IEEE Symposium on Fusion Engineering, Shanghai, China. (7/7/2017)
26th IAEA Fusion Energy Conference, Kyoto, Japan. (10/21/2016)
29th Symposium on Fusion Technology, Prague, Czech Republic. (9/5/2016)
(Among others)

Public Seminars at Kyoto University:

"Global Warming: The Challenge toward Carbon Negative," Kyoto University GSAIS Symposium, Kyoto, Japan. (7/23/2018)
"Energy and the Environment – A Life Cycle Perspective," Kyoto University Open Seminar, Kyoto, Japan. (11/26/2018)