



A strategic assessment of Asian Pacific biomass demand and supply to 2030

A multi-client study

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HAWKINS WRIGHT

Content of this prospectus

Why this report is needed.....	3
Summary of report contents.....	4
Experience and expertise of Hawkins Wright.....	5
Our client base	6
The full table of contents	7
Table of contents (continued)	8
List of tables in the report.....	9
List of figures in the report.....	10
Order form	11
Terms & conditions	12



Why this report is needed

North-east Asia is quickly emerging as a new engine of growth for the biomass and bioenergy industries. Driven by pledges made under the Paris Agreement to reduce greenhouse gas emissions, and by ambitious national renewable energy targets, Japan, South Korea and potentially China will see a rapid expansion in biomass-fired power and CHP generation over the next decade. This should create a large new market – rivalling that of Europe – for global biomass suppliers.

Feedstock sourcing strategies

The emerging Asian market is likely to develop in different ways. While cofiring and conversion projects may favour wood pellets for technical reasons, new-build biomass plants with modern fluidised bed boilers will have greater fuel flexibility, including wood chips, palm kernel shells (PKS) and, in some cases, rubberwood, bagasse and other agricultural residues.

South Korean and Japanese imports of biomass are already growing rapidly. Imports of wood pellets, PKS and wood chips have quadrupled over the past four years to 4.8Mt. Questions remain, however, about the availability of biomass feedstocks at price points that are within the paying capability of the Asian generators.

Wood pellet supply chains are well-established, with bankable counterparties and robust sustainability criteria, but new demand will require new pellet manufacturing capacity. If this new capacity is to be developed, whether it be in Asia, North America or Australia, for example, most pellet suppliers will require long-term and bankable offtake contracts priced at levels that justify the investment.

An alternative is palm kernel shells. PKS is a lower-cost fuel, but its supply is limited to countries where oil palm is grown, mainly Indonesia, Malaysia and Thailand. Export availability is small relative to the potential demand. Some of the countries of origin are keen to encourage the local consumption of PKS to help meet their own renewable energy targets. Indonesia, for example, imposes an export tax on PKS to discourage exports, adding another element to the fuel supply risk.

Wood chips are another alternative. There is a well-established wood chip supply chain in Asia that currently serves the pulp and paper industry almost exclusively. Trade in energy chips is being developed alongside these pulp chip trade flows, but the Asian chip market is tightening. Demand for pulp quality wood chips is rising, particularly in

China, while the supply of wood chips from Indonesia, Thailand, Vietnam, Australia and Latin America is struggling to keep up. Potential energy chip consumers in Asia may soon find that they are competing with the superior paying capability of pulp manufacturers.

So, the feedstock sourcing strategies for prospective generators of biomass heat and power in Asia are not at all straight forward. Nor are the marketing strategies for prospective biomass suppliers.

Management of supply risk

In developing a fuel sourcing strategy, utilities need a thorough understanding of the biomass resource base from which they intend to source their fuel, together with the commercial and technical attributes of alternative biomass materials and suppliers. As is always the case in the energy industry, the management of fuel supply risk will be of paramount importance. This report pays particular attention to the comparative costs of biomass supply to Asia for different materials from different origins as well as to the robustness of their supply chains. It also assesses the sensitivity of supply cost to changes in raw feedstock costs, freight costs and exchange rates, for example.

Likewise, biomass suppliers require a deep understanding of the energy markets and of the policy mechanisms that are used to support the development of renewable energy in each jurisdiction. In Europe, policy risks were, in general, poorly assessed and suppliers will be keen to avoid making similarly expensive errors in Asia. A key focus of this report is an analysis of the paying capability of Asian biomass buyers and the sensitivity of their business models to changes in policy mechanisms, electricity prices, exchange rates and other variables.

Methodology:

This report is based upon extensive market research in Japan, South Korea, China and south-east Asia. This fieldwork yielded unique insights into the reality of the Asian biomass market and its future prospects. Desk-based research and interviews with industry participants were also an important supplementary source of information. Over 35 years Hawkins Wright has built up a wide network of contacts, and extensive market information databases. This experience has enabled us to provide unrivalled, highly respected market intelligence.



Summary of report contents

- **Electricity generation in Japan, South Korea and China.** Market structures and the factors driving the countries' renewable energy policies.
- **The operation and value of policy instruments** (e.g. Feed-in Tariffs in Japan and the Renewable Portfolio Standard in South Korea) used to promote the development of renewable electricity generation. The value of these instruments to a biomass power producer. The biomass paying capability of a variety of hypothetical biomass power projects, both cofiring and 100% dedicated biomass plants.
- **Profiles of biomass power projects in the region**, including both dedicated-biomass and cofiring projects. The capacity of each project, including its ownership and its technical, planning and financial status. Each project's estimated annual feedstock requirement and its likely feedstock preferences/flexibility, port and transport infrastructure. Insights into the procurement approaches used by different buyers.
- **Forecasts of biomass feedstock demand** in Japan, South Korea and China to 2030, distinguishing between wood chips, wood pellets and PKS.
- **Feedstock supply.** Comprehensive assessments of biomass availability – wood chips, wood pellets, PKS and agri-residues – domestically and in the principal feedstock supply regions around the Asian Pacific Rim: South East Asia (Vietnam, Indonesia, Malaysia, Thailand and the Philippines), North East Asia (China and eastern Russia), Australia, North America (British Columbia, the US Pacific North West and the US South) and Latin America.
- **The competitive advantages and disadvantages** of potential sources of feedstock supply.
 - » **Short and long run costs of biomass supply** to CIF Japan, South Korea and China, per tonne and per GJ: considering the price of raw biomass – wood fibre (roundwood and residues) and PKS – processing costs (chipping & pelletisation etc.), storage and logistics and the capital invested in supply chains.
 - » **The sustainability of biomass supply**, commercially and environmentally. Calculations of the GHG emissions of different feedstock supply chains are included.
 - » **Advantages and disadvantages of different feedstocks** downstream of CIF are discussed. Comparisons of the chemical and physical composition of different biomass fuels, how these features influence power plant efficiency, storage and handling capacities, CAPEX requirements, feedstock substitution.
- **Constraints and risks for investors and biomass suppliers:** planning policy; environmental policy, including sustainability criteria and forest certification; bankability of suppliers and offtakers, feedstock supply risk; technical/operational risk; political risk etc.

Who should read this report?

This report will be essential reading for all companies with exposure to the emerging biomass market in the Asian Pacific Rim, including energy generators, wood pellet and other biomass fuel suppliers, energy and biomass traders, forestry/plantation owners and investors, non-energy wood chip buyers (e.g. pulp manufacturers), oil palm plantation owners and palm oil processors, shipping companies, financial institutions, energy regulators and policy makers.

Questions answered...

- » What resources will be available to supply fuel to biomass heat and power generators in north-east Asia through 2030?
- » Under different scenarios, what is the outlook for biomass demand in north-east Asia through 2030? What forms of biomass will be favoured; wood chips, wood pellets, PKS...?
- » What are the advantages and disadvantages of the different forms of biomass with respect to cost competitiveness, sustainability criteria, combustion characteristics, logistics and the bankability of counterparties?
- » What are the short-run and long-run biomass paying capabilities of generators in Japan and South Korea? How do the generators' paying capabilities compare to the costs of feedstock supply?
- » What factors should a generator take into account when developing an optimal biomass fuel supply strategy?



Experience and expertise of Hawkins Wright

Hawkins Wright Ltd. is a privately-owned consulting company headquartered in London, UK. With more than 35 years of experience, we are a trusted source of information for international pulp, paper and biomass industries. Our services include consultancy assignments on a full range of marketing, financial and strategic subjects as well as regular multi-client reports and newsletters.

Hawkins Wright is highly successful within its specialist areas. Our bioenergy practice has been operating for ten years and regularly wins consultancy assignments from leading companies and investors in the biomass and energy industries. In recent years we have provided due diligence services to more than ten individual biomass power projects, advising on the biomass fuel market, fuel procurement strategies and contracting options.

We have launched three flagship information services for the bioenergy sector, covering the areas of biomass feedstock markets, renewable electricity and heat and the interpretation and impact of government policy. Our monthly **Forest Energy Monitor** has been published since 2009, and has retained a loyal readership throughout this time. Our quarterly **Outlook for Wood Pellets** service is subscribed to by companies that control >85% of North American industrial wood pellet capacity and at least 55% worldwide.

Hawkins Wright is similarly successful in other forest industry sectors. In pulp, for example, companies that control over 90% of global market wood pulp capacity are subscribers to our services.

Hawkins Wright has worked in Asia for many years. Most of the large Japanese trading companies, for example, subscribe to our services and/or have commissioned private consultancy assignments from us. We are also well known in South Korea, having provided consultancy services to several South Korean paper companies as well as some utilities. In China, Hawkins Wright has published its **Defining the China Market for Pulp, Paper and Board** report annually since 2003, and we have provided market due diligence services to several Chinese papermakers and investors.

This deep penetration of global forest products markets has allowed Hawkins Wright to develop high level contacts throughout the industry and unique insights into the trends that are driving the strategic decisions of forest products and energy companies worldwide.

Hawkins Wright is entirely independent. We are not involved in the buying, selling, growing, manufacturing or management of timber resources, pulp or paper, wood pellets, lumber, energy or carbon. Our advice is therefore completely objective and untainted by conflicts of interest.

Our bioenergy consultancy services:

- » Due diligence for biomass power projects
- » Biomass market assessment
- » Modelling and risk assessment
- » Policy interpretation and explanation
- » Fuel procurement strategy assessment
- » Supply/demand analyses and price forecasts

Recent assignments

- » A due diligence assessment of the wood pellet supply strategy of a Japanese biomass power project. Commissioned on behalf of a prospective investor (a Japanese bank).
- » An assessment of cost competitiveness of different wood pellet suppliers CIF Japan.
- » A market due diligence assessment of wood pellet supply in Asia to 2037. The report was commissioned by a Japanese bank considering debt finance for a 75MW biomass power plant.
- » A due diligence assessment of a new-build pellet CHP project in the United Kingdom.
- » A due diligence assessment of a proposed investment in an existing wood pellet mill in the United States.
- » A commercial feasibility study into a proposed investment in a greenfield wood pellet mill in Australia.
- » Due diligence assessments of the feedstock supply strategies of three separate coal-to-biomass conversion projects in the United Kingdom.



Our client base

Hawkins Wright's client list includes leading pulp and paper manufacturers from around the world, energy companies, forest owners, wood pellet manufacturers, pulp, paper and biomass agents and traders, financial institutions, equipment and raw material suppliers, and national, state and provincial governments and agencies. Four fifths of our revenue is generated from clients outside of the UK.

See following link for a full list of our clients www.hawkinswright.com/market-research-pulp-paper/our-clients

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The full table of contents

1. Electricity generation in East Asia	1
Electricity generation trends in East Asia.....	2
The changing structure of Japan's electricity sector.....	3
Japan's Strategic Energy Plan, 2014.....	4
Japan's planned energy mix in 2030.....	5
South Korea: Trends in electricity generation.....	6
Planned changes to South Korea's generation mix to 2030.....	7
2. Policy instruments	9
Policy drivers in Japan – Feed-in Tariff (FIT).....	10
Policy drivers in Japan - GHG emission reduction & renewables targets.....	12
Policy drivers in South Korea - Renewable Portfolio Standard.....	13
Policy drivers in South Korea - carbon trading scheme.....	14
Policy drivers in China	15
Biomass paying capability	17
Biomass paying capability: Japanese dedicated biomass power	18
Biomass paying capability: Japanese biomass cofiring indifference price	19
Biomass paying capability: South Korea dedicated biomass power	20
Biomass paying capability: South Korean biomass cofiring indifference price	21
3. The pipeline of biomass power projects.....	23
The requirements and procurement approaches of Asian biomass buyers	24
Map of operational biomass power projects in Japan ≥49MW	26
Map of planned biomass power projects in Japan ≥49MW	27
Biomass power project developers in Japan.....	28
Operational dedicated biomass power plants (>20MW) in Japan	32
Operational biomass cofiring plants in Japan	33
Planned dedicated biomass plants in Japan (≥49MW)	34
Planned biomass cofiring plants in Japan (≥49MW).....	35
Map of biomass power projects in South Korea	36
Biomass power project developers in South Korea	37
Operational biomass power plants in South Korea	40
Biomass power plants under construction or planned in South Korea	41
Biomass power developers in China.....	42
Biomass power demand in China	43
4. Forecasts of biomass demand to 2030	45
Summary of historic and planned biomass demand in Japan and Korea	46
Planned biomass demand in Japan to 2030	47
Planned biomass demand in South Korea to 2030	48
Forecast of biomass demand in Japan and South Korea to 2030	49



Table of contents (continued)

5. Biomass availability and feedstock supply.....	51	6. Competitive advantage and disadvantage of different feedstocks and sources.....	99
Summary of biomass resources used and potentially available for the north east Asian market ...	52	Comparison of biomass fuel characteristics	100
Introduction to biomass supply	53	The physical and chemical attributes of different biomass fuels	101
Global overview of wood fibre resources	54	Long and short run costs of biomass supply to north east Asia	102
Forest resources, inventories and removals in the United States.....	55	Drivers of cost competitiveness – industrial wood pellets	103
Forest resources in the United State: the impact of the changing age class distribution.....	56	Wood pellet supply cost curves, all suppliers, CIF Japan	105
Forest resources in the United States: regional variations in wood fibre availability and prices.....	57	Wood pellet supply cost curves, bankable suppliers, CIF Japan	106
Forest resources in the United States: summary statistics	58	Trends in the delivered prices of industrial pellets to Japan and South Korea	107
Forest resources in Canada.....	59	Drivers of cost competitiveness – wood chips.....	108
Forest resources and competing industries in Canada	60	Trends in the delivered prices of wood chips to Japan and South Korea.....	109
Forest resources in Russia.....	61	Drivers of cost competitiveness – PKS cost drivers and price trends.....	110
Forest and other biomass resources in China	62	Comparison of delivered prices of chips, pellet and PKS (on an energy basis).....	111
Forest resources in Vietnam	64	Sustainability and supply chain GHG emissions.....	112
Wood processing residues in Vietnam.....	65	7. Constraints and risks for buyers, suppliers and investors.....	115
Forest resources in South Korea	66	Constraints and risks for buyers, suppliers and investors	116
Forest resources in Japan.....	67	Appendices	121
Forest resources and rubberwood supply in Thailand.....	68	Glossary	122
Forest resources and competing industries in Indonesia	69		
Forest resources in Australia.....	70		
Wood processing residues in Australia	72		
Introduction to wood pellet supply	73		
Wood pellet supply; the main producing regions: Vietnam	74		
Wood pellet supply; the main producing regions: Thailand	75		
Wood pellet supply; the main producing regions: Malaysia, Indonesia, Philippines, Australia.....	76		
Wood pellet supply; the main producing regions: Russia.....	77		
Wood pellet supply; the main producing regions: South Korea, China, Canada.....	78		
Wood pellet supply - summary of North American capacity	79		
Wood pellet supply, the main producing regions: The United States.....	80		
Wood pellet supply, the main producing regions: Europe and the Rest of the World.....	81		
Black pellets - market overview	82		
Introduction to woodchip supply.....	83		
Woodchip supply - Vietnam.....	84		
Woodchip supply - Australia	85		
Woodchip supply - other exporting countries	86		
Introduction to palm kernel shells (PKS).....	87		
Palm Kernel Shells (PKS) and other oil palm residues.....	88		
The market for palm kernel shells (PKS)	89		
Agricultural residues and unconventional biomass - palm oil by-products	94		
Agricultural residues and unconventional biomass	96		



List of tables in the report

Table 1: Electricity generation by fuel source in Japan, South Korea and China, 2016	2
Table 2: South Korea: Renewable electricity capacity by technology, 2017 & 2030	7
Table 3: 20-year support levels for biomass power in Japan's FIT, ¥/kWh	10
Table 4: REC weighting for biomass technologies in the Korean RPS	13
Table 5: China's five-year biomass pellet/briquette use for heating plan	15
Table 6: Japan: Biomass paying capability of a hypothetical 75MW biomass power plant	18
Table 7: South Korea: Biomass paying capability of hypothetical biomass power plants	20
Table 8: Japan: Operational dedicated biomass power plants (>20MW)	32
Table 9: Japan: Operational biomass cofiring plants	33
Table 10: Planned dedicated biomass plants - Japan (≥49MW)	34
Table 11: Japan: Planned biomass cofiring plants (≥49MW)	35
Table 12: South Korea: Operational biomass power plants	40
Table 13: South Korea: Biomass power plants under construction or planned	41
Table 14: Biomass demand by fuel type and source in Japan and South Korea, 2017	46
Table 15: Summary of biomass demand by fuel type in Japan and South Korea, 2015-2017	46
Table 16: Current and possible future availability of biomass to serve north east Asian demand	52
Table 17: Summary of biomass types and characteristics	53
Table 18: Top ten countries reporting the greatest annual forest area losses/gains, 2015	54
Table 19: US forest area, 1997-2017	58
Table 20: US timberland area, 1997-2017	58
Table 21: US growing stock (inventory) , 1997-2017	58
Table 22: US annual removals (timber harvest) 1996-2016	58
Table 23: South Korea: Forest area and growing stock by year	66
Table 24: Japan: Forest area and growing stock by year	67
Table 25: Forecast hardwood log supply from plantations	71
Table 26: Australia forest plantation area by region, 2016	71
Table 27: South East Asian wood pellet production, by country, 2016	73
Table 28: Global industrial wood pellet capacity, by region and company	74
Table 29: Pinnacle Renewable Energy's operating and under construction pellet mills	79
Table 30: Enviva's operating and under construction pellet mills	79
Table 31: Selection of torrefied/steam exploded wood pellet mill projects	82
Table 32: Vietnamese woodchip exporting ports	84
Table 33: Sample of key Australian woodchip mills	85
Table 34: Malaysia PKS production	90
Table 35: Indonesia PKS production	90
Table 36: Selection of key PKS suppliers	93
Table 37: Estimated EFB, mesocarp fibre and PKS production in Malaysia	94
Table 39: Palm oil by-product production as a percentage of FFB processed	94
Table 38: Estimated EFB, mesocarp fibre and PKS production in Indonesia	94
Table 40: Estimate of Indonesian OPT production	95
Table 41: Estimate of Malaysian OPT production	95
Table 42: Indicative chemical and physical characteristics of biomass fuels	101
Table 43: The costs of industrial wood pellet supply to North East Asia, Q1 2018	103



List of figures in the report

Figure 1: Electricity generation in Japan, South Korea and China, 1985-2016	2	Figure 43: Exports of hardwood pulp chips to Asia, by origin, 2006-2016	83
Figure 2: Japan: Electricity generation by fuel/technology	3	Figure 44: Map of Vietnamese chip ports	84
Figure 3: Japan: Planned energy mix in electricity generation, 2030	5	Figure 45: Map of Australian chip ports	85
Figure 4: South Korea: Electricity generation, 1981-2017	6	Figure 46: Palm oil mill distribution in Malaysia	87
Figure 5: South Korea: Electricity generation by fuel/technology	6	Figure 47: Palm oil mill distribution in Indonesia	87
Figure 6: South Korea: Renewable electricity capacity by technology, 2017 & 2030	7	Figure 48: Palm oil by-products	88
Figure 7: Certified biomass capacity in Japan	10	Figure 49: Japan, South Korea PKS imports from Malaysia, Indonesia	89
Figure 8: Trajectory of the Korean RPS, 2012-2024	13	Figure 50: Malaysia, Indonesia estimated PKS production vs exports	90
Figure 9: Carbon prices in the Korean ETS Jan 2017 - Mar 2018, in KRW and USD	14	Figure 51: Indonesia CPO production vs plantation size	91
Figure 10: Summary of wood pellet paying capabilities and indifference prices	17	Figure 52: Malaysia CPO production vs plantation size	91
Figure 11: Japan: Calculation of the biomass cofiring indifference price	19	Figure 53: Gliricidia sepium, planted as a fence	96
Figure 12: South Korea: Calculation of the biomass cofiring indifference price	21	Figure 54: Pinyon pine and juniper woodland landscape, Arizona	97
Figure 13: Map of operating Japanese biomass power projects 49MW and above	26	Figure 55: The industrial wood pellet supply cost curves, ALL suppliers	105
Figure 14: Map of planned Japanese biomass power projects 49MW and above	27	Figure 56: The industrial wood pellet supply cost curves, BANKABLE suppliers	106
Figure 15: South Korean operating and planned biomass power projects	36	Figure 57: Historic pellet prices, CIF Korea, per tonne	107
Figure 16: Major wood pellet importing ports in South Korea	36	Figure 58: Historic pellet prices, CIF Japan, per tonne	107
Figure 17: Chinese coal-fired power plants in relation to major crop producing regions	43	Figure 59: Hardwood chip costs, FOB Vietnam, in USD and VND	109
Figure 18: Historic biomass demand in Japan and Korea, 2015-2017	46	Figure 60: Hardwood chip costs, FOB Australia, by species	109
Figure 19: Planned biomass demand in Japan and Korea, 2015-2017	46	Figure 61: Historic PKS prices, CIF Japan, Jan 2016 to Jan 2018	110
Figure 20: Breakdown of Japanese biomass demand pipeline, Mt pellet equivalent	47	Figure 62: Hardwood chip and pellet prices, CIF Korea, per GJ	111
Figure 21: Breakdown of Japanese biomass demand pipeline, PJ	47	Figure 63: Wood pellet, wood chip, PKS prices CIF Japan, per GJ	111
Figure 22: Breakdown of Korean biomass demand pipeline, Mt pellet equivalent	48	Figure 64: Carbon intensity of biomass fuels delivered to South Korea	112
Figure 23: Breakdown of Korean biomass demand pipeline, PJ	48	Figure 65: Carbon intensity of biomass fuels delivered to Japan	112
Figure 24: Japanese biomass demand forecast	49	Figure 66: Summary of GHG emissions <u>savings</u> from different biomass types	113
Figure 25: South Korean biomass demand forecast	49	Figure 67: Breakdown of supply chain emissions for Canadian pellets	114
Figure 26: Illustrative flows of wood fibre in the Asian market	53	Figure 68: Breakdown of supply chain emissions for Vietnamese pellets	114
Figure 27: World forest growing stock in 2015 versus removals, in million m ³	54		
Figure 28: Growth and removals on timberland in the US South, 1996-2016	55		
Figure 29: Area of timberland in the US South by stand-size class	56		
Figure 30: Pulpwood stumpage and delivered prices in the US South, Q4 2017	57		
Figure 31: Canadian paper and paperboard production 1990-2030f	60		
Figure 32: Map of Chinese planted and natural forests by region	63		
Figure 33: Vietnam: export value of wooden furniture 2006-2016	65		
Figure 34: Map of Australian plantation forestry resources, 2017	70		
Figure 35: Establishment of new forest plantations in Australia 1990-2016	70		
Figure 36: Australian softwood sawmills by region and log input capacity, m ³	72		
Figure 37: Australian hardwood sawmills by region and log input capacity, m ³	72		
Figure 38: Global wood pellet capacity and the status of projects under development	73		
Figure 39: Industrial wood pellet capacity and projects in the Asia Pacific region	73		
Figure 40: South East Asia existing industrial wood pellet production capacity	75		
Figure 41: Location of Russian pellet mills over 30kt/y	77		
Figure 42: Location of North American wood pellet mills over 200kt/y	80		



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