

SAILING THROUGH TOUGH TIDES



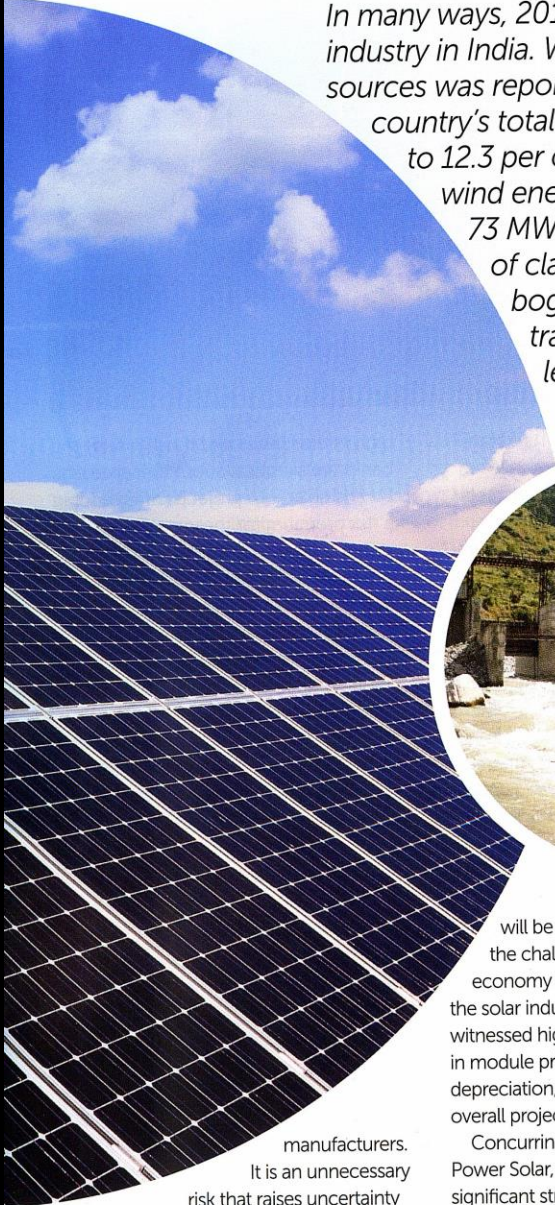
It is hailed as the country's sunrise sector and is one of the most prominent ones compared to some of its other counterparts in the renewable energy industry. According to the Ministry of New and Renewable Energy (MNRE), India added 395 MW of solar capacity in the first 7 months of the fiscal year 2013-2014, which will end on March 31, 2014. For the current fiscal year, the Indian government has set a solar target of 1.1 GW. The country added 73 MW of new solar capacity in October. Under Phase I of the programme, which ran from 2010 up to 2013, the JNNSM awarded contracts for 950 MW of solar

power through a reverse bidding process. Under the second phase of the JNNSM, which will remain in vogue from 2013 to 2017, India aims to support the development of a total of 3 GW of solar power projects.

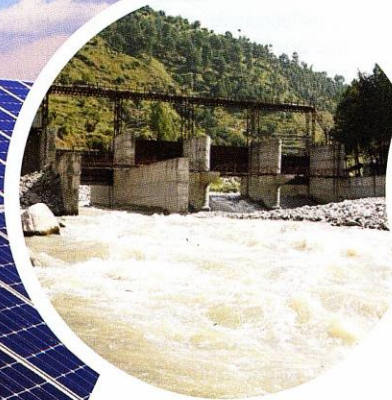
However, a report by clean energy communications and consulting firm Mercom states, "With 420 MW of CSP projects missing commissioning dates, India is not likely to register any significant year-over-year installation growth for 2013, even as global solar market is forecasted to grow by over 20 per cent."

It goes on to add, "Guidelines and

requests for selection (RfS) have finally been published for Phase II Batch I, for 750 MW of PV projects. Unfortunately, India has decided to include domestic content requirements for half (375 MW) of PV projects, which may be enough to cause a trade dispute but not enough to help domestic



*In many ways, 2013 was a mixed bag for the renewable energy industry in India. While power generation from renewable sources was reported to be on the rise, with its share in the country's total energy mix rising from 7.8 per cent in 2008 to 12.3 per cent in 2013, the reinstatement of GBI for the wind energy sector and the country adding around 73 MW of new solar capacity, hurdles such as a lack of clarity in policy and rise in prices, continued to bog the industry. **Energy Next** details on what transpired in the year gone by and what are the lessons in store in the year ahead*



manufacturers. It is an unnecessary risk that raises uncertainty with minimal reward." According to the proposed time line, these 750 MW of JNNSM Phase II projects will not be commissioned until at least May 2015. Therefore, projects under the schemes are where the action

will be in 2014. It is believed that the challenges faced by the Indian economy last year also affected the solar industry. In 2013, the market witnessed high inflation, an 8 per cent rise in module prices and a 15 per cent rupee depreciation, all of which contributed to overall project costs.

Concurring, Ajay Goel, CEO, Tata Power Solar, states, "While we have made significant strides in the development of solar power, India has a long way to go in terms of realising its full solar potential. The sector continues to face several challenges, including higher cost of solar power generation, bank funding and bottlenecks in the acquisition of land for

solar power projects."

He goes on to add that the industry is also affected by the challenges faced by the Indian economy comprising of higher inflation rates, price hikes of modules and decreasing value of rupee which contribute to the overall project costs. The election season with polls in several states has stalled solar projects by a few months since non-agricultural land transactions cannot be approved by the government during this period.

Reverse auctions in India too continue to defy odds and go in the opposite direction with record low bidding, especially in states that have an L1 type bidding mechanism (lowest bid must



be matched by all) in place. Current economic conditions, solar irradiance and off-taker creditworthiness do not look to be reflected in these bids. With bids fluctuating almost 50 per cent over the year when comparing state-to-state, it is imperative to have deep insight and market intelligence to be successful in this environment.

With some states yet to sign PPAs and the upcoming general elections, preliminary estimates are tentatively 1,750 MW of solar installations in India for 2014. Although the projected installation growth looks impressive, it includes 420 MW of CSP projects that did not get installed in 2013.

Apart from this, Goel believes that solar solutions providers face barriers all along the business chain — from manufacturing to development and installation to financing of solar power projects. "Phase II of JNNISM policy has not yet taken off and the

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plans announced by different state governments have not materialised to its full extent. The domestic solar manufacturing sector has been seriously impacted by imports from China and other countries." Chinese module manufacturers, he informs, are selling their modules well below the manufacturing cost with the help of subsidies provided by their government which poses a problem for fair competition.

Moreover, duties levied on import of raw materials required to manufacture have made domestic products (cells and modules) costlier than Chinese imports which are duty-free. Despite notifications to the effect that these are exempted, domestic manufacturers are unable to use it due to ambiguities.

Those in the industry state that the price of photovoltaic panels too is rising in India as a global supply glut eases and a weaker rupee increases the cost of imports. Rahul Gupta, director of Rays Power Experts Pvt., a solar plant contractor, was recently quoted as stating that "crystalline silicon modules are selling in India at ₹ 35 to ₹ 45 a watt, up by about 5 per cent this year."

Financing is yet another area of concern for the solar industry. "Installation or expansion financing in India is one of the most expensive in the world. The country suffers from

high interest rates and most Indian banks are skeptical about the value of PV and solar PPA projects, often adding a risk premium for these projects," states Goel.

The report by Mercom also reveals that owing to low bids and credit rating of utilities, banks, fearful of inconsistent payments, are concerned about lending to projects. "Most said that they need more clarity before they will lend on VGF projects." Bulk of the projects under JNNISM Phase II policy will be constructed through next year and state-led projects are also expected to see some action in 2014. More number of programmes will get funding while PV demand will also increase. Phase II of JNNISM now specifies that 50 per cent of the projects (375MW) need to be built with domestically manufactured cells and modules. Similar provisions such as Domestic Content Requirement (DCR) in state policies as well as future solar policies will tremendously boost local manufacturing as well as make solar business viable in the long term.

Availability of low cost funds for projects and attractive financing schemes would help boost the sector considerably, advises Goel. Hopeful about the year ahead, he avers that 2014 promises to be "a year of recovery for the solar sector in India."

JNNSM – Phase I

Phase I Batch I: PPAs for Batch I projects were signed for 610 MW (140 MW-PV, 470 MW-CSP). Of the 470 MW that were originally due to be commissioned by May 2013, only one 50 MW CSP project has been completed whereas in PV, 140 MW of projects were commissioned. The remaining projects have been given an extension until March 2014.

According to Mercom, 150 MW of the 470 MW CSP projects are in advanced stages of development. Once commissioned, these projects will receive tariffs between ₹ 10.49-12.24, a premium of almost 40 to 50 per cent over new PV projects (most of which are currently bidding in the ₹ 6.50-8.00 range). These projects will not be penalised for delaying up to a year. It is time to eliminate the required PV: CSP ratio for good and let the market decide on the best and most cost-effective technologies.

Phase I Batch II: Around 330 MW of the 340 MW in Batch II have been commissioned with the remaining 10 MW delayed and most likely will be cancelled.

JNNSM - Phase II

Around 750 MW of grid-connected PV projects will be auctioned under the Viability Gap Funding (VGF) scheme. Due to the delay in announcing Phase II, these projects are not expected to be commissioned until at least May 2015. Out of the 750 MW, 375 MW will have a

separate bidding process and will have a domestic content requirement under which solar cells and modules used must be made in India.

Developers can either opt to bid for "DCR" or "open" categories. The "open" category will have no domestic content requirement. Under VGF, developers will sign a PPA for 25 years to sell power at a fixed tariff of ₹ 5.45/kWh. In the case of accelerated depreciation, the tariff will be reduced by 10 per cent to ₹ 4.75/kWh. The maximum limit for VGF is 30 per cent of the project cost, or ₹ 2.5 crore/MW, whichever is lower.

There have been some mechanisms added to ensure project performance; a minimum capacity utilisation factor (CUF) of 17 per cent over a year has been set. Projects have to maintain a CUF within -15 per cent and +10 per cent of their declared value until the end of 10 years from Commercial Operations Date subject to the CUF remaining over a minimum of 15 and within -20 per cent and +10 per cent thereafter until the end of the PPA duration of 25 years.

Another major change in the guideline compared to the draft proposal is the payment schedule which has not been welcomed by developers. The VGF payment will be released in tranches: 50 per cent on successful commissioning of the full capacity of the project, and the rest progressively over the following 5 years (10 per cent each year) subject

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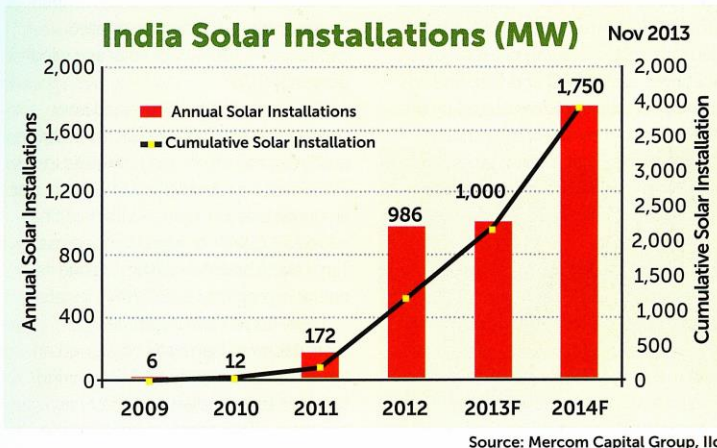
to the project meeting generation requirements (CUF) within a specified range per the policy guidelines.

Wind

This sector emerged as the most promising renewable energy source in India. As of March 2013, the country had an installed wind capacity of 19.1 GW, making it the world's fifth-largest wind energy producer.

According to D V Giri, secretary general, Indian Wind Turbine Manufacturers Association (IWTMA), while the wind energy sector did suffer a setback with no incentive policy in the entire financial year 2012-13, the reinstatement of Generation Based Incentive (GBI) has helped the sector. "We are glad that the GBI has been reintroduced with an upper cap of ₹ 1 crore to cover projects in the plan period 2012-17."

Admitting to **Energy Next** that GBI will greatly help the Indian Power Producers (IPPs) to plan large projects,



Utility-Scale Solar Projects in India	
Operational and under development	
Updated on November 08, 2013	
	Capacity (MW)
In-operations	
Solar PV	2,024
Solar Thermal	56
Total	2,080
Under Development	
Solar PV	2,535
Solar Thermal	445
Total	2,980

Source: Mercom Capital Group, IIC



STATE WISE AND DAY WISE WIND POWER GENERATION

State	Region	As on				
		31.03.2013	April '13	May '13	June '13	July '13
		Installed Capacity in MW	Capacity in MW	Generation in Mus	Capacity in MW	Generation in Mus
Andhra Pradesh	Southern	447.7	462.4	14.22	465.6	42.91
Gujarat	Western	3174.9	3197.55	196.84	3231.0	694.98
Karnataka	Southern	2135.3	2135.30	2.48	2135.30	3.08
Kerala	Southern	35.1	35.1	2.44	35.1	7.52
Madhya Pradesh	Western	386.0	386.0	36.26	386.0	59.31
Maharashtra	Western	3021.8	3115.05	303.9	3171.6	550.7
Rajasthan	Northern	2684.9	2684.9	202.0	2697.1	420.0
Tamil Nadu	Southern	7162.3	7167.1	266.73	7175.2	1858.0
Total		19048	19183.4	1024.87	19296.9	3636.5

he also stressed on the definite need for reintroduction of accelerated depreciation (AD), as it would help the MSME sector and those who use the generated power for captive use. "We hasten to add that AD is a tax deferral and not a subsidy and is available to many products inclusive of high efficiency coal fired boilers," he said.

However, some others in the industry felt that there have been some problems as well. Vineet Mittal, co-founder and Managing Director of Welspun Energy Ltd told Energy Next, "There was a lot of cheer in August 2013 when the government announced restoration of subsidy for the wind sector. The proposal revived GBI of ₹ 500 per megawatt-hour. It also raised the cap on total subsidy, whereby a wind-based power producer can claim over 10 years by 61 per cent to ₹ 10 million."

He further went on to add that this good run faces serious roadblocks. The overall power sector is already under pressure due to increasing interest rates. "The wind tariff in states like Tamil Nadu, Karnataka and Gujarat is not attractive due to low wind regimes, exploitation of good sites, increased land prices and transportation cost."

Some others felt that despite the reinstatement, a delay in the re-introduction of GBI caused much uncertainty in the sector. "By the time it was announced, some investment decisions had been delayed enough such that the projects

can only get commissioned in the next financial year. While the introduction of GBI has provided certainty on this, the sector is facing higher uncertainties and delays in execution of PPAs, regulatory process in each state, compliance to RPOs, scheduling regulations, etc lead to higher cost of capital by 150-250 bps – increasing cost of wind energy between ₹ 0.40/kwh to ₹ 0.70/kwh," Arvind Bansal, CEO & Director, Continuum Wind Energy Pvt Ltd, stated.

Others like A S Karanth, executive advisor, consultant, DIF, believes that GBI is only good for IPPs. Adding further, he stresses on the need for clarity from the government's side, in terms of what they announce. "It is only when there is clarity on policy that things will fall into place. Apart from policy certainty, infrastructure should also be made available. This can be done by incentives such as AD and GBI, tax laws that are very clear and facilitated by the MNRE. Once they say it, they should not backtrack. That is not happening because of political reasons, since they want to hang everyone in uncertainty."

Concurring, Dr K. Kasthurirangaian, chairman of the Indian Wind Power Association (IWPA), also feels that the lack of policy support from the government has taken away the vibrancy of working from the wind power industry in India. "The installation of evacuation lines and infrastructure does not keep pace with

additions of wind mills. As of now, 80 per cent of the total energy from wind mills is only evacuated and infrastructure for evacuating balance of energy is in the process of being put up."

However, despite some of the issues, of the 29,000 MW of renewable energy set up in India, the number of wind energy installations were reported to be to the tune of 19,500 MW. Moreover, companies investing in the wind energy sector also spelt good news for the industry. For instance, Tata Power was reported to be developing wind projects having a total generation capacity of over 160 MW in the country. It already has an installed wind energy generation capacity of 398 MW with projects across Maharashtra, Rajasthan, Gujarat, Tamil Nadu and Karnataka. On the other hand, Welspun Energy intends to have an installed capacity of 1,700 MW of solar and wind power by 2017.

Reports by Mercom revealed how Green Infra, a renewable energy power producer, acquired a majority stake in TVS Energy, a subsidiary of TVS Motor, for an undisclosed amount. "With this, it has added 59.75 MW of wind farms across Tamil Nadu and Maharashtra, taking its operating capacity to 377 MW", it stated.

Spain-based wind turbine manufacturer Gamesa too signed an agreement to supply 54 MW in wind turbines to an Indian electric utility company. The contract calls for the

ON INDIA FROM APRIL 2013 TO MARCH 2014

Month Wise Wind Power Generation								
June'13		July'13		Aug'13		Sep'13		
Generation in Mus	Capacity in MW	Generation in Mus	Capacity in MW	Generation in Mus	Capacity in MW	Generation in Mus	Capacity in MW	Generation in Mus
42.91	513.8	11.00	531.5	199.95	574.7	147.19	582.7	69.77
694.99	3249.9	425.32	3256.5	621.48	3275.4	472.13	3283.8	DNA
3.08	2152.90	632.48	2170.90	737.32	2170.90	528.65	2170.90	280.69
7.52	35.1	12.63	35.1	11.47	35.1	8.78	35.1	9.30
59.31	386.0	60.38	386.0	70.52	386.0	64.45	386.0	36.96
550.7	3298.5	630.3	3350.8	869.0	3384.5	672.42	3448.0	DNA
420.0	2721.5	507.0	2721.5	399.0	2721.5	327.0	2721.5	285.0
858.0	7195.80	2195.00	7217.30	1604.00	7239.80	1394.00	7274.59	964.00
1636.51	19553.5	4474.11	19669.5	4512.74	19787.85	3614.62	19902.54	1645.72

wind farm development, as well as the supply, installation, commissioning and maintenance for 10 years of 27 G97-2.0 MW wind turbines at Tagguparthi, Andhra Pradesh, India. The commissioning is likely to be completed by May 2014.

Small Hydro Power

The MNRE, which has been vested with the responsibility of developing Small Hydro Power (SHP) projects up to 25 MW station capacities, aims that the SHP installed capacity should be about 7,000 MW by the end of 12th Plan. Also, the focus of the SHP programme is to lower the cost of equipment, increase its reliability and set up projects in areas which give the maximum advantage in terms of capacity utilisation.

An estimated potential of about 15,000 MW of small hydro power projects exists in India. The MNRE has created a database of potential sites of small hydro and 5,415 potential sites with an aggregate capacity of 14,305.47 MW for projects up to 25 MW capacity has been identified.

In 2012-13, the total fund released under the SHP programme was ₹ 158.92 crores. So far, the government has recognised 6,474 small hydro power sites with an aggregate capacity of 19,749 mw. Also, financial assistance to the tune of ₹ 150 crore is being provided to the states by the Centre for the development of small hydro-power projects.

Additionally, the MNRE is providing 'Central Financial Assistance (CFA)' to set up small/micro hydro projects both in the public and private sectors. Financial support is also given to the state government for identification of new potential sites including survey and preparation of detailed project reports, renovation and modernisation of old SHP projects and water mills.

Till now, 985 small hydro power projects with an aggregate capacity

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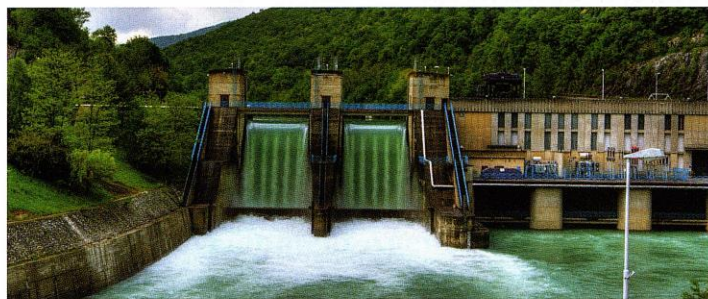
of 3754 mw have been set up and 265 projects aggregating to 945 mw are under implementation in various states. By the end of April 2013, 967 small hydro projects with an aggregate capacity of 3,632 MW were installed in India, with 24 states announcing a policy to invite private sector bodies to set up projects. In addition, 281 small hydro projects with a total capacity of 1,061 MW are under construction.

One of the notable developments in the sector last year was the meeco Group signing an exclusive agreement with German kinetic hydropower systems expert Smart Hydro Power GmbH (SHP) to promote and develop Smart Hydro technology-based projects in India. In fact, a first demonstration project has been executed and is in operation in Punjab in association with the Punjab Energy Development Agency (PEDA).

Commenting on this, Dieter Trutschler, sales director of The meeco Group said, "India has a very strong potential for the smart hydro kinetic hydropower technology."

Biomass

The year 2013 was a significant one for the biomass sector with various initiatives being announced. One of the most significant being an initiative on biomass cookstoves developed under the Clean Development Mechanism (CDM) of the United Nations Frameworks Convention on Climate Change, so as to reduce the cost of improved stove technologies to rural customers through the sale of carbon credits.



MNRE minister Farooq Abdullah who launched the programme, stressed on the need for clean cookstoves. "Increased use of clean and efficient cookstoves is crucial to reduce the burden of disease from indoor air pollution as well to avoid the overuse of biomass resources. Efficient cooking technologies have a direct tangible impact on the livelihoods of the poor, as they save time and money that previously had to be spent on procuring cooking fuels," he said.

Yet another project supports the preparation of a biomass roadmap which envisages adding about 5,700 MW of biomass power by 2017, and a cumulative 20,000 MW by 2022. Titled "Removal of Barriers to Biomass Power Generation in India, Phase I", this UNDP programme, which is being undertaken with support from MNRE and is slated for completion in 2014, aims to accelerate the use of environmentally sustainable biomass power and co-generation technologies in the country and improve electricity supply through renewable energy sources.

The MNRE is also promoting setting up of biomass power projects under its scheme on Grid connected Biomass Power/ Bagasse Cogeneration in sugar mills. Various fiscal and financial incentives such as central financial assistance (CFA) which depend on the capacity of the power plant and its location and fiscal incentives including concessional customs duty on import of machinery and components, excise duty exemption, accelerated depreciation on major components and relief from taxes are being provided for setting up of biomass based power projects. Besides, preferential tariff is provided for sale of

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power from biomass power projects.

A report in May, 2013 revealed that about 95.5 per cent of the surveyed biogas plants have been found functional. Also, a target for setting up of about 1.06 lakh family type biogas plants has been fixed in the country for 2013-14 under the National Biogas and Manure Management Programme (NBMMMP) of the Ministry.

Also, during 2012-13, a total amount of about ₹ 56.20 crore was released to various states for grid connected biomass power/ bagasse cogeneration projects. For the 12th Five Year Plan, the target is to install 5.75 lakh biogas plants in the country.

According to estimates by Energy Alternatives India (EAI), India produces about 450 to 500 million tones of biomass annually and the scope for power from this sector in the country varies from about 18,000 MW to almost 50,000 MW. Other studies also support the finding that the biomass sector holds immense promise for India. A study by Metso, a Finnish cleantech company, reveals that the total available potential for biomass based power in India is estimated at 23,700 MWe, which is divided between agro-residues (approximately 17,000 MWe) and cogeneration (7,000 MWe). By 2022, the installed biomass power capacity is estimated to reach 10,000 MWe.

Studies by the World Bank too indicate that over 15 per cent of India's gross energy input comes from biomass and

the number of users of this sector for household energy is slated to increase till 2030. The MNRE estimates surplus biomass availability at about 120 to 150 million metric tonnes per annum. This includes agricultural and forestry residues, which correspond to an annual potential of about 18,000 MW.

Additionally, the Ministry is also promoting biomass-gasifier-based power plants for production of electricity via locally available biomass resources in locations where surplus biomass such as small wood chips, rice husks, arhar stalks, cotton stalks, and other agro-residues is available to meet the unmet demand for electricity, Metso stated.

The government is also planning to initiate the National Bioenergy Mission, proposed to be launched during the 12th Five Year Plan. The aim is to create a policy framework for attracting investment and to facilitate rapid development of commercial biomass energy market based on utilisation of surplus agro-residues and development of energy plantations.

However, the sector, states a study by Ernst & Young, will need to address challenges such as inconsistent availability of biomass with a reasonable cost structure which acts as an impediment for the competitive use of biomass for energy. Also, difficulty in managing feedstock chain due to the unorganised nature of the market poses a concern. **EN**