

**Bill No. 163 of 2022**

THE WIND TURBINE AND SOLAR ENERGY WASTE (HANDLING,  
DISPOSAL AND RECYCLING) BILL, 2022

By

SHRIMATI POONAMBEN HEMATBHAI MAADAM, M.P.

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BILL

*to provide for proper handling and disposal of waste being generated by wind turbine and solar energy devices by prescribing norms and fixing responsibilities and duties on manufacturers, re-cyclers and consumers with regard to disposal of the waste generated by wind and solar energy devices and for matters connected therewith or incidental thereto.*

WHEREAS decisions were taken at the United Nations Conference on the Human Environment held at Stockholm in June, 1972, in which India participated, to take appropriate steps for the protection and improvement of human environment;

WHEREAS decisions were taken as part of Paris Agreement, 2015 regarding Nationally Determined Contributions (NDC);

AND WHEREAS it is considered necessary to implement the decisions aforesaid to protect the environment from the ill-effects of non-biodegradable garbage;

AND WHEREAS article 48A of the Constitution enjoins upon the State to endeavour to protect and improve the environment and to safeguard the forests and wildlife of the country.

BE it enacted by Parliament in the Seventy-third Year of the Republic of India as follows:—

Short title, extent and commencement.

1. (1) This Act may be called the Wind Turbine and Solar Energy Waste (Handling, Disposal and Recycling) Act, 2022.

(2) It extends to the whole of India. 5

(3) It shall come into force on such date as the Central Government may, by notification in the Official Gazette, appoint.

Definitions.

2. In this Act, unless the context otherwise requires,—

(a) “appropriate Government” means in the case of a State, the Government of that State and in all other cases, the Central Government; 10

(b) “Board” means the Central Board for the Prevention, Control and Abatement of Wind Turbine Waste and Solar Energy Waste constituted under section 4;

(c) “wind turbine waste” means the waste generated from the foundation, tower, components of the gearbox and generator and turbine blades;

(d) “solar energy waste” means waste generated from solar panels, photovoltaic (PV) solar modules and other product which are discarded, surplus, obsolete, broken from solar energy devices; 15

(e) “disposal” means disposal of wind turbine waste and solar energy waste according to prescribed norms to prevent contamination of ground water, surface water, ambient air quality and harmful effect on human health; 20

(f) “hazardous waste” means any wind turbine waste and solar energy waste which by reason of any of its physical, chemical, reactive, toxic, flammable, explosive or corrosive characteristics causes danger or is likely to cause danger to health or environment, whether alone or when in contact with other wastes or substances.

(g) “operator” means a person or establishment owning or operating a facility for collection, transportation and disposal of wind turbine waste and solar energy waste; 25

(h) “consumer” means a person using products capable of generating wind turbine waste and solar energy waste;

(i) “re-cycler” means any person or establishment engaged in re-cycling or re-processing of used solar equipment or wind turbine or assembly of their component; 30

(j) “storage” means the temporary containment of wind turbine waste and solar energy waste in a manner so as to prevent its littering and hazardous effects on human being;

(k) “transportation” means carrying of wind turbine waste and solar energy waste from one place to other place hygienically through specially designed transport vehicle 35

so as to prevent littering and harmful effects on human being;

(l) “distributor” means any person who distributes or re-sell wind turbine or photovoltaic modules under his own name or trademark in the country;

5 (m) “importer” means any person who sell photovoltaic modules from a third country in India;

(n) “distance seller” means any person who sell solar-wind energy equipment and modules by means of distance communication directly to private households or to users other than private households in India; and

(o) “prescribed” means prescribed by rules made under this Act.

10 **3.** The disposal of wind turbine waste and solar energy waste by any person or company knowingly or otherwise in any drain, landfill, at public places such as streets, roads, market place, open vacant plots and such other places is hereby prohibited.

Prohibition on disposal of wind turbine waste and solar energy waste in public place.  
National Policy for Scientific Management of Wind and Solar Waste Management.

15 **4.** The Central Government shall, within six months of the commencement of this Act, prepare and publish in the Official Gazette a National Policy for Scientific Management of Wind Turbine Waste and Solar Energy Waste Management for management of wind turbine waste and solar energy waste throughout the country.

Constitution of Central Board.

20 **5. (1) The Central Government shall, by notification in the Official Gazette, constitute a Board to be known as the Central Board for the Prevention, Control and Abatement of Wind Turbine Waste and Solar Energy Waste for effective implementation of the provisions of the Act.**

**(2) The Board shall consist of Chairperson and such other members to be appointed by Central Government in such manner as may be prescribed.**

(3) The salary and allowances payable to, and other terms and conditions of services of Chairperson and members of the Board shall be such as may be prescribed.

25 **6. (1)** The Board shall be responsible for prevention, control and abatement of wind turbine waste and solar energy waste in the country.

Functions of the Board.

(2) Without prejudice to the generality of the foregoing provision, the Board shall perform all or any of the following functions, namely:—

30 (a) advise the Central Government on any matter concerning improvement of recycling of wind turbines, cells, panels and the prevention, control or abatement of solar energy waste;

(b) monitor the implementation of the compliance criteria and procedure for handling and disposal of wind turbine waste and solar energy waste;

35 (c) grant authorization and registration to a person or an agency engaged in collection or dismantling or recycling of wind turbine waste and solar energy waste provided that the applicant possesses appropriate facilities to handle the waste safely;

(d) prescribe guidelines for household solar and wind energy users;

(e) plan and cause to be executed a nation-wide programme for the prevention,

control and abatement of solar energy waste;

(f) plan and organize training of persons engaged or to be engaged in programmes for prevention, control and abatement of solar waste on such terms and conditions, as may be prescribed;

(g) enhance information exchange, education and awareness raising programmes in all sectors of society through mass media regarding prevention, control and abatement of solar waste; 5

(h) collect, compile and publish technical and statistical data relating to wind turbine waste and solar energy waste and the measures devised for its effective prevention, control and abatement; 10

(i) prepare manuals, codes or guides relating to prevention, control and abatement of solar energy waste;

(j) prevent and monitor illegal dumping of solar energy waste;

(k) improve institutional and technical capabilities of regional and sub-regional centres with training and technology transfer; 15

(l) collect and disseminate information in respect of matters relating wind-solar pollution; and

(m) perform such other functions as may be prescribed.

Responsibilities  
of Appropriate  
Government.

7. The appropriate Government shall,—

(a) ensure that all the wind turbine waste and solar energy waste generated within its territorial jurisdiction is handled and disposed of in accordance with compliance criteria and procedure as may be prescribed; 20

**(b) facilitate infrastructure facilities for collection, storage, transportation and disposal of solar and wind energy waste and wind turbine waste;**

(c) after due authorization, permit the operator to collect, transport and dispose of the solar waste and wind turbine waste in such manner as may be prescribed; 25

(d) ensure earmarking or allocation of industrial space or shed for wind turbine waste and solar energy waste dismantling and recycling in the existing and upcoming industrial park, estate and industrial clusters;

(e) ensure recognition and registration of workers involved in dismantling and recycling of wind turbine waste and solar energy waste; 30

(f) undertake industrial skill development activities for the workers involved in dismantling and recycling of wind turbine waste and solar energy waste;

(g) undertake annual monitoring and to ensure safety and health of workers involved in dismantling and recycling of wind turbine waste and solar energy waste; 35

(h) prepare integrated plan for effective implementation of provisions for importers and distant sellers;

(i) preparation and submit annual report to Ministry of Environment, Forest and

Climate Change regarding prevention, control and abatement of wind turbine waste and solar energy waste; and

(j) encourage setting up of integrated Treatment, Storage and Disposal Facility (TSDFs) for 'hazardous waste' management on Public Private Partnership (PPP) mode in clusters of hazardous waste generating industries.

**8.** It shall be the duty of every manufacturer,—

Duty of  
Manufacture.

(a) to obtain Extended Producer Responsibility (EPR) Authorization and manage their responsibilities;

(b) to ensure that every solar and wind energy device offered for sale in the market contains—

(i) the procedure for its handling and disposal; and

(ii) the information about the parts which may be recycled and which not be re-cycled.

(c) to set-up adequate number of collection centers for the hazardous waste;

(d) to informing treatment facilities of the product's composition, including the potential use of hazardous materials;

(e) to inform end customers regarding disposal of their old PV modules;

(f) to create public awareness through advertisements, publications and other electronic media about the hazardous substances in their products which may cause ill effects on human body;

(g) to reduce the movement of hazardous and other wind turbine waste and solar energy waste;

(h) to take complete responsibility financial and otherwise for the recovery and recycling of the wind turbine waste and solar energy waste;

(i) to design the products to facilitate dismantling and recovery; and

(j) to report annually of the wind turbines and PV modules to the prescribed agency of appropriate Government.

**9.** It shall be the duty of every consumer to ensure that the wind turbine waste and solar energy waste is not disposed of in any manner except in the manner prescribed for the purpose.

Duty of  
consumer.

**10.** It shall be the duty of every re-cycler to,—

Duty of  
Re-cycler.

(a) get his product registered with the appropriate Government in such manner as may be prescribed;

(b) re-cycle only those parts of an solar and wind energy equipment that has been marked as re-cyclable by the manufacturer;

(c) achieve mandatory collection and re-cycling targets as may be prescribed;

(d) ensure that he is utilizing environmentally sound technologies and possesses,

adequate technical capabilities, requisite facilities and equipment to recycle, reprocess or reuse hazardous wastes, as approved by the Central Pollution Control Board;

(e) ensure that the recycling processes are in accordance with the standards laid down in the guidelines published by the Central Pollution Control Board from time to time,

(f) ensure that residue generated thereof is disposed of in a hazardous waste treatment storage and disposal facility; and

(g) obtain authorization and maintain records of wind turbine waste and solar energy waste handled by him and file annual return to Central Pollution Control Board.

Transportation of Wind Turbine Waste and Solar Energy Waste.

**11.** The transportation of wind turbine waste and solar energy waste shall be carried out as per the manifest system whereby the transporter shall be required to prevent leakage of the wind turbine waste and solar energy waste to informal sector during transportation and hazardous waste shall be transported as per protocols. 10

Duty of Importer and Distant Dealer.

**12.** It shall be the responsibilities of the importer and distant dealer to,—

(a) collect the wind turbine waste and solar energy waste from the consumer and deposit it to the collection centre or dismantler or recycler as designated by manufacture in such manner as may be prescribed, as the case may be; and 15

(b) ensure all protocols are followed as prescribed for the manufacture.

Penalty.

**13.** (1) Where a person or the company contravenes any of the provisions of this Act or of any rules made under the act shall be punished with imprisonment for a term and with fine in such manner as may be prescribed. 20

*Explanation.*—For the purpose of this section “company” means any corporate and includes a firm or other association of individuals.

(2) Urban Local Bodies shall collect the fine under sub-section (1) and the funds may be used to strengthen wind turbine and solar energy waste disposal system within their jurisdiction. 25

Act to have overriding effect.

**14.** The provisions of this Act shall have effect notwithstanding anything inconsistent therewith contained in any other law for the time being in force.

Power to make rules.

**15.** (1) The Central Government may, by notification in the Official Gazette, make rules for carrying out the purposes of this Act. 30

(2) Every rule made under this Act shall be laid, as soon as may be after it is made, before each House of Parliament, while it is in session, for a total period of thirty days which may be comprised in one session or in two or more successive sessions, and if, before the expiry of the session immediately following the session or the successive sessions aforesaid, both Houses agree in making any modification in the rule or both the Houses agree that the rule should not be made, the rule shall thereafter have effect only in such modified form or be of no effect, as the case may be; so, however, that any such modification or annulment shall be without prejudice to the validity of anything previously done under that rule. 35

## STATEMENT OF OBJECTS AND REASONS

Wind and solar energy seem more promising than ever. Fossil fuel is one of the major causes of the climate crisis. Renewable energy can limit climate disruption and boost energy security. India plans to generate 500 gigawatts of non-fossil energy by 2030, including 140 GW of wind and 280 GW of solar power. Questions remain about whether the waste created at the end of the life cycle from solar panels and wind turbines will be as dangerous as the fossil fuels which they aim to replace.

Though most part of wind turbines are made up of recyclable materials such as steel, iron, copper, and aluminium, rotor blades are made of composite materials based on carbon fibres, plastics, and resins. Due to their large size and sturdy build, transportation becomes expensive. Therefore, wind turbine blades pose a significant economic and environmental challenge as they reach their end-of-life stage. With some techniques, these can be reused and, eventually, turbines need to be de-commissioned.

Manufacturing solar panels often require the use of several noxious chemicals. Add to that, solar panels have an operating lifespan of around 20 to 30 years. A solar panel is essentially made up of several sheets of silicon crystals called cells. Each cell making up a solar panel is sandwiched by an aluminium and glass layer. Together, they form the energy-producing components that convert sunlight into electricity. Normally silicon is recyclable, but to improve the solar cell's electrical efficiency, metals such as cadmium and lead are added. Studies have shown these metals can leach out of the cells and get into groundwater, as well as affect plants. These metals also have detrimental effects on human health as lead is known to impair brain development in children, and cadmium is a carcinogen. Several components of solar energy devices are hazardous and should be disposed of in a manner that does not harm the environment.

Due to these challenges, non-conventional energy resources will lose their inherent environmental benefit if legislative and infrastructure frameworks are not effective for waste handling, disposal, and recycling. If waste recycling is left to the vagaries of the informal sector, we would face irreversible environmental damage and health problems. Many workers engaged in informal waste management operations are the most vulnerable and unaware of the hazards associated with them. The legal framework for the disposal of solar and wind energy waste will enable the adoption of clean energy in an ethical way and manufacturers, distributors, and consumers will be held responsible for the generated waste. It will also enable us to develop new business models for renewable energy as this waste contains many valuable and rare materials. A holistic approach to unconventional energy includes not only a green and clean perspective but also resource and material management.

The large cost gap between recycling and discarding solar panels and wind turbine blades in landfills points to an unpleasant truth that manufacturers or consumers will not dispose of the solar cells or panels properly without regulations. With regulations, there will be an encouragement to invest in research to reduce pollutants and recycling costs.

Promoting the 3 R Concept (Reduce, Reuse and Recycle) for Hazardous Waste, the bill envisages creating a policy and infrastructure framework for proper channelization of solar and wind energy waste for processing. The fundamental approach is precautionary or polluter-pays principles, with the cardinal principles of accountability, transparency, and sustainability to ensure its proper implementation. While oil and gas prices have reached

record-high levels, renewables are getting cheaper all the time. If energy prices will be lower and more predictable, there will be positive effects on food and economic security.

As society continues to adopt unconventional power, the problem of disposal may worsen in the coming decades and we will lose the benefits of using clean energy. It is estimated that solar and wind waste will become the most prevalent form of waste in landfills in India soon. It is, therefore, high time that matter may be regulated before the situation becomes alarming.

Hence this Bill.

NEW DELHI;  
5 July, 2022.

POONAMBEN HEMATBHAI MAADAM



## FINANCIAL MEMORANDUM

Clause 5 of the Bill provides that the Central Government shall constitute a Board to be known as the Central Board for the Prevention, Control and Abatement of wind turbine waste and solar energy waste for effective implementation of the provisions of the Act. Clause 7 of the Bill provides that the appropriate Government shall facilitate infrastructure facilities for collection, storage, transportation and disposal of waste. The expenditure relating to States shall be borne out of the Consolidated Funds of the respective States. The Central Government may also have to provide some financial assistance to the States for this purpose. Also, the expenditure in respect of Union territories shall be borne out of the Consolidated Fund of India. The Bill, therefore, if enacted would involve expenditure from the Consolidated Fund of India. It is estimated that a sum of rupees four hundred and sixty crore will be involved as recurring expenditure per annum from the Consolidated Fund of India.

A non-recurring expenditure of rupees five crore is also likely to be involved.

MEMORANDUM REGARDING DELEGATED LEGISLATION

Clause 15 of the Bill empowers the Central Government to make rules for carrying out the provisions of the Bill. As the rules will relate to matters of detail only, the delegation of legislative power is of a normal character.

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