



agrinergy



AGRINERGY AND MANIKARAN POWER TO DEVELOP CARBON MARKET PROJECTS

The Clean Development Mechanism (CDM) is an arrangement under the Kyoto Protocol whereby projects that reduce greenhouse gas (GHG) emissions that are undertaken in developing countries can claim financial benefits in the form of carbon credits. Under this mechanism emissions of each tonne of CO₂, or its equivalent in other GHGs that are reduced, are eligible to earn a carbon credit, generally known as a CER. Investors in such projects can therefore generate additional revenues through the sale of carbon credits.

Agrinergy Pte Ltd is a global CDM consultancy firm, headquartered in Singapore with a presence throughout Asia and Europe - India, China, Indonesia, Malaysia, Thailand and the UK. Agrinergy is backed by one of the largest buyers of carbon credits and has strong partnerships with the leading carbon funds, banks and compliance utilities.

Manikaran Power Ltd is a pioneer member of the Indian Energy Exchange and has a considerable experience in the electricity trading sector through its professional relationships with electricity generation utilities and its focus on contributing positively to energy related issues.

Joint Carbon Market Services:

Agrinergy Consultancy Pvt Ltd and Manikaran Power Ltd have entered into an association to provide services to the clients of Manikaran Power for all carbon offset mechanisms including **Clean Development Mechanism (CDM)** and **Voluntary Carbon Standard (VCS)**. Clients across the eligible sectors such as Wind, Hydro Power, Biomass Energy, Waste Heat Recovery in Steel and Cement sectors, Energy Efficiency across various industries etc can avail our services to register their potential projects.

Agrinergy with its global presence and a thorough understanding of the carbon market permits cutting edge structures to be provided to customers in terms of the sales of carbon credits. With a broad portfolio of projects across sectors we are well placed to assess and develop potential projects within your company.

The services offered to the clients include:

- Identification of CDM/ VCS projects
- Development of CDM/ VCS projects
- Registration with UNFCCC
- Post Registration services including monitoring and verification of projects
- Sales of arising carbon assets (CERs and VERs)

Through the association, Agrinergy with its technical CDM expertise, will provide services to potential projects and together with Manikaran Power will offer a one stop carbon market solution to the power sector and other industries in India.

If you are looking to undertake CDM projects and would like to receive more detailed information on a particular project type or discuss the project in greater detail please do not hesitate to contact us.

Contact Us:

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Manikaran Power: Pravin Abraham+91 98198 34600 pravin@manikaranpowerltd.in

If you have undertaken or are undertaking projects which have potential to be developed in the carbon market, please send us the following details and we will revert to you with our assessment of the project potential.

Company Details:

Name	
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Company	
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Contact Number	
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Address	
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E-mail address	
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Project Details :

Project Capacity and Technical Details	
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Commissioned	Yes/No
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Date of Commissioning	
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Project Location	
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Registered under CDM/VCS	Yes/No
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Volume of CER/VERs issued	
Volume of CER/VERs Expected	

Interested in (Please highlight your area of interest):

- CDM Project Development
- Sales of CERs (Issued CERs/ Future CERs)
- Carbon Financing
- CDM Feasibility Study
- VER Project Development
- Sales of VERs

ECONOMICS OF CLIMATE CHANGE

Climate change is the most critical global challenge of the day. Recent events have emphatically exhibited our growing vulnerability to climate change. Climate change impacts will range from affecting agriculture, rise in the sea level and accelerated erosion of coastal zones, increased intensity of natural disasters, extinction of species and spread of vector-borne diseases. Most anthropogenic emissions are emitted from the use of fossil fuels, aerosols, cement manufacture deforestation etc.

The Stern review has drawn numerous conclusions on the climate change impacts. The review estimates that if action is not taken at the current stage then it will be equivalent to losing at least 5% of the global GDP each year. On the other hand, the cost of reducing GHG emissions would account to only 1% GDP a year. If action is not taken, the level of emissions could reach double its pre-industrial value by as early as year 2035, virtually rising the global temperature by 2°C. At present, it is very difficult to stabilize at 450 ppm of CO₂e. However, we may also lose the opportunity to stabilize at 500-550 ppm of CO₂e.

The review also mentions that the cost of taking action is unevenly distributed among the sectors and countries. Climate change is now growing into a business opportunity. Therefore, ignoring climate change would hamper the economic growth. The power sector requires eliminating at least 60% carbon by 2050. Also, a concrete climate change policy—covering issues like carbon pricing, supporting innovative clean technologies and eliminating barriers to energy efficiency—is the prime requirement. In conclusion, the key elements of future international frameworks must include emissions trading, technology cooperation, action to reduce deforestation and adaptation among the developed and developing nations.

KYOTO PROTOCOL

The Kyoto Protocol is an agreement made under the United Nations Framework Convention Climate Change (UNFCCC). Countries that ratify this protocol commit to reducing their emissions of carbon dioxide and five other greenhouse gases (GHG): CH₄, N₂O, HFCs, PFCs and SF₆, or engaging in emissions trading if they maintain or increase emissions of these gases. It was adopted at the third session of the Conference of Parties to the UNFCCC (COP3) in 1997 in Kyoto, Japan.

Kyoto is a 'cap and trade' system that imposes national caps on the emissions of Annex I countries. On average, this cap requires developed countries to reduce their emissions 5.2% below their 1990 baseline over the 2008 to 2012 period. More than 170 nations have ratified the pact. However, not all the countries have to cut their emissions by 5.2%. Only 37 relatively developed countries have agreed to targets for 2008-12 under a principle that richer countries have the most responsibility towards climate change. The emission cuts range from an 8 percent cut for the European Union from 1990 levels to a 10 percent rise for Iceland. Although these caps are national-level commitments, in practice most countries will devolve their emissions targets to individual industrial entities, such as a power plant or paper factory. One example of a 'cap and trade' system is the 'EU ETS'.

Kyoto has legal force since Feb. 16, 2005. The United States, which is the world's biggest source of emissions but which is also being surpassed by China, is yet to ratify the Kyoto Protocol. Countries that fail to meet their targets in 2012 will have to make both the promised cuts and 30 percent more in a second period from 2013.

BIOMASS SECTOR

Agricultural biomass residues and other renewable resources are carbon neutral in the sense that they absorb the same amount of carbon in growing as they release when consumed as a fuel. They are beneficial as they can be used to generate electricity with the similar equipments or power plants that are now burning fossil fuels. Energy production from biomass is economically competitive, more so with CDM revenues and hence is gaining significance as a source of clean energy. Renewable biomass can include rice husks, cotton/soybean straws and palm oil processing residues, bagasse etc.

The opportunities for CDM within this sector include:

- Use of biomass to generate electricity and/or steam
- Burning of biomass to replace fossil fuels used in the boiler
- Mitigation of methane by avoidance of dumping of biomass in the landfills

Agrinergy has its expertise in biomass based projects and successfully registered a wide variety of projects with clients ranging from textile and oil mills to power intensive industries such as steel and cement. Many of these projects are in their second cycle of CER generation and trading. Developing a CDM project with Agrinergy can aid the project owner to secure additional revenue streams to grow in a clean and sustainable way.

Agrinergy has a very strong track record of developing biomass based power projects, having been involved in the first project registered in this sector. Agrinergy has also developed the methodology (ACM0006) for this particular sector which gives expertise of the projects in this sector.

Case Study: JCT Hoshiarpur Small Scale Biomass Project, India Agrinergy developed a CDM project for JCT Ltd, a leading Indian textile and nylon manufacturer in the creation of a CDM project for biomass based cogeneration. The project involves the installation of a 6MW power plant at JCT's filament yarn plant to displace electricity generation from fossil fuel based plants within the grid, which is highly coal intensive. The project is expected to generate over 31,000 emission reductions annually.

The project was undertaken at RSCL sugar processing plant in Tamil Nadu, India. The CDM project will displace electricity generation from fossil fuel based plants that dominate the national grid by installing a cogeneration system on the site fired by bagasse, a carbon neutral fuel. The project will enable the plant to increase electricity production, reduce dependence on fossil fuel and grid electricity and make use of bagasse, a waste product. The project anticipates a reduction of over 80,000 tCO₂ per year.



CEMENT, IRON AND STEEL INDUSTRY

Cement and steel industry are at the forefront of economic development in the rapidly industrializing countries. These industries are highly energy intensive and results in significant emissions of GHGs from the process and the energy use. CDM project opportunities in the cement and steel industry include:

- Electricity generation from the waste heat gases (Waste Heat Recovery)/ Blast furnace gas
- Use of less carbon intensive alternative fossil fuels within the production process
- Electricity generation from the waste heat gases (Waste Heat Recovery)/ Blast furnace gas
- Use of less carbon intensive alternative fossil fuels within the production process

Agrinergy has been involved in developing and implementing a variety of projects in these sectors, having developed a methodology for blended cement production (ACM0005) and waste heat recovery (AM0004). Agrinergy therefore has a detailed understanding of the projects and is involved in their day-to-day operation. This has led to a consistent, ensured performance and consistent CER delivery of the project activity.

Case Study: ACC Cements Project, India

ACC Cement, one of the largest cement manufacturers in India; partnered with Agrinergy to create a project which utilizes CDM to overcome the barriers in increasing the blend of fly ash at eight of its plants. The project activity will displace clinker with fly ash in the production of PPC. This will reduce clinker production and the associated CO₂ emissions due to consumption of fossil fuels. It will also enable utilization of fly ash, an industrial waste that is considered hazardous. A key impact of the project activity is environmental as limestone is a finite resource and mining of limestone can have adverse environmental effects whereas, fly ash is a by-product of electricity generation and its disposal can be difficult. The project is expected to generate more than 400,000 CERs annually.

Case Study: Shri Bajrang Waste heat recovery project , India

Bajrang Ispat and Power, partnered with Agrinergy to develop their waste heat project as a CDM project to overcome the financial barriers facing the project. The project activity will displace fossil fuel based power with electricity generated from waste heat and gases, reducing the dependence on fossil fuel for power generation. The project is expected to generate more than 112,606 CERs annually.



Solid Waste Management Projects

The disposal and treatment of waste, as well as health and sanitary impacts, is a major issue and problem in many parts of the developing world. Often solid organic waste is left in unmanaged landfills - at these sites, the waste will decompose under anaerobic conditions, and will emit CH₄ which is a potent GHG, with a contribution to global warming 21 times that of CO₂. Similarly, waste water containing organic matter from palm oil mills, sugar & alcohol factories etc. are generally treated in open ponds and lagoons, emitting large quantities of methane. CDM projects in the MSW sector include :

- Composting of solid waste
- Co-composting of waste water and solid waste
- Capture and destruction of methane from managed sanitary landfills
- Collection and incineration of solid wastes
- Bio-methanation of organic waste to generate biogas and hence electricity/steam
- Anaerobic treatment of waste water and subsequent flare/ use of biogas

Agrinergy assists the project owners in identifying projects, undertakes baseline studies, partnering with technology providers and facilitates the whole CDM process from registration to identifying buyers for the sale of carbon credits generated. Depending on the project,

Case Study: SBES waste to energy project, India. Agrinergy has partnered Solapur Bio Energy Systems Pvt. Ltd. (SBES) to create a project which converts solid waste generated in Solapur, India into energy plus compost. The project utilizes CDM to overcome the financial and technological barriers in waste handling and disposal in India. The project activity will receive approximately 300 tonnes per day of waste and process 150 tonnes per day of biodegradable waste. The project activity contributes to sustainable development by reducing emissions of methane and generating renewable electricity that will displace fossil-fuel based generation. The project is expected to generate 51,400 CER annually

Sugar Sector

The sugar sector globally has the potential to offset GHG emissions by replacing fossil fuel based power generation by using bagasse (a renewable biomass produced by milling of cane). Normally sugar factories are self sufficient which means they have their own power and heat generation set up. If a sugar factory undertakes expansion in power production the additional power can be exported to the national grids which are largely fossil fuel based and power deficient. Additionally, sugar industry itself produces waste which if remain untreated can be a potential source of GHG emissions.

Therefore, companies can capitalize on carbon markets through reductions of GHG emissions. Carbon credits can be created in the sugar sector and through industries associated with the sugar sector (such as ethanol production). The following project types have substantial potential to make it as CDM projects:

- **Bagasse based electricity generation**
- **Installing or upgrading on site process equipment and cogeneration facilities to be more efficient**
- **Wastewater treatment through anaerobic digestion as opposed to anaerobic lagoons, to avoid methane emissions**
- **Treatment of distillery effluents , to reduce methane emissions**

Agrinergy has a very strong track record of developing bagasse based power projects, having been involved in the first project registered in this sector. In cases where approved methodologies did not yet exist, Agrinergy developed and submitted methodologies for approval.

Case Study: RSCL grid based bagasse cogeneration expansion project The CDM project will displace electricity generation from fossil fuel based plants that dominate the national grid by installing a cogeneration system on the site fired by bagasse, a carbon neutral fuel. The project contributes to sustainable development by adding income to local economy, generating jobs and establishing healthcare and educational facilities for the rural area. The project will enable the plant to increase electricity production, reduce dependence on fossil fuel and grid electricity and make use of bagasse, a waste product. The project anticipates a reduction of over 80,000 tCO₂ per year.



Thermal Power Sector

Thermal power sector is the most polluting industry across the globe and accounts for more than half of the total carbon dioxide emissions. This industry faces tremendous pressure to use better technology, alternative fuels and efficient alternatives to reduce the carbon dioxide emissions per unit of electricity. With countries witnessing high economic and hence electricity consumptions growth rates, this sector has the maximum potential and the greatest responsibility to reduce its carbon dioxide emissions. Technological improvements would play a significant role in assisting this sector to achieve its carbon emission targets. Following are the potential projects which can qualify as CDM project in this sector:

- **Use of lower carbon intensive fossil fuels (Gas based power plants) for power generation**
- **Fuel Switching to lower carbon intensive fossil fuels/ renewable fuels (for eg. From coal to gas based generation)**
- **Use of efficient technology in thermal power plants (super critical technology, efficient boilers and turbines)**
- **Efficiency improvement measures, renovation of power plants.**

For the power generation industry, besides financial incentives CDM can become a powerful tool to transfer advanced technology to the developing nations at an attractive price.

Case Study: Gas based CCGT, Indonesia

Agrinergy is developing the 130 MW CCGT power plant by PT. Bekasi Power in Java, Indonesia. The project would use natural gas to generate electricity using highly advanced combined cycle technology and replace power generated using coal and diesel. The project has the potential to generate approximately 260,000 CERs annually.

Case Study: Gas based CCGT, India

Agrinergy is developing the 300 MW CCGT power plant in the state of Gujarat, India. The project involves the installation of grid connected power plant using highly advanced combined cycle technology and replace power generated using coal as a majority fuel. The project has the potential to generate approximately 350,000 CERs annually.

Case Study: Turbine & Boiler Replacement, India Agrinergy is developing 4 projects in India in the thermal power sector which involves improving energy efficiency in a thermal power plant through the replacement of turbines and boilers in the state of Gujarat, India. Each project has the potential to generate approximately 200,000 CERs annually.



HYDRO & WIND POWER

Hydro and wind power have been a very successful in reducing emissions under the CDM framework and this area offers the potential for further development. There is a growing recognition of the benefits that this clean power brings. Emissions reductions from hydroelectric and wind projects come from offsetting grid electricity by replacing it with a zero-emissions source of power. Since in most countries grid generation is dominated by fossil fuel fired plants, such projects can generate large number of carbon credits. Hydro projects are beneficial as they provide cheap, clean and low maintenance electricity apart from flood control and storage of water supplies for domestic and agricultural use. Hydro power plants with minimum social and environmental impacts with other significant benefits for social development are considered excellent CDM projects.

The following types of hydro projects have been successfully registered under CDM to date:

- Run of river hydro projects
- Hydro projects using existing dams and reservoirs
- Large scale projects with relatively small flooded area as compared to electricity generation.
- Bundled small wind projects and individual wind mills
- Independent power producer wind farms

Agrinergy is developing more than 15 hydro CDM projects across India, Thailand and Indonesia. Our projects include both large scale and small scale projects. With enormous amounts of investment being made in wind power across the south-east Asia, Agrinergy is aware of the tremendous potential in the wind industry. Agrinergy has worked closely with wind experts in India and Europe to develop structures to suit the CDM requirements of the wind industry.

Case Study: Mangalam Small Hydro Project, India Agrinergy is co-developing two small scale hydro projects with an installed capacity of 7.5MW as CDM projects for Mangalam Energy Development Company. These are run of river hydro projects without storage of water. The generated power is to be supplied to the regional grid replacing fossil fuel based power generation at the grid. The project activity will generate new jobs opportunities for the local community and hence contribute to poverty alleviation and also development of basic amenities leading to an improvement in living standards of the community. The project anticipates reduction of over 38,000 CERs.