ABSTRACT

Higher Education – TANII – State Innovation Fund – 2018-19 – Annamalai University – Funds for the scheme of 'Solar based improved power quality interleaved boost converter fed marine boat involving DC /hybrid drive' – Sanctioned - Orders – Issued.

Higher Education (H1) Department

G.O.(2D) No.27 Dated: 19.08.2019.
விகாரி வருடம், ஆவணி – 02
திருவள்ளுவர் ஆண்டு, 2050

Read:

1. G.O.(Ms) No. 124 Planning, Development and Special Initiatives (SP.1) Department dated 24.10.2014
2. G.O.(Ms) No. 153 Planning, Development and Special Initiatives (SP.1) Department dated 23.12.2014
3. From the Member Secretary, State Planning Commission letter No.1500/PC/SPC/2018, dated. 31.12.2018.
4. From the Registrar (i/c), Annamalai University letter No.G5/2019, dated. 18.01.2019 & 26.2.2019.

ORDER:

The Member Secretary, State Planning Commission in his letter third read above has stated that the shelf of schemes recommended for the year 2018-19 (Round II) by the State Planning Commission for implementation are as follows:-

S.No.	Name of the Scheme	Cost of the project			
		1st Year	2nd Year	3rd Year	Total
		(Rs. in lakh)			
	Annamalai University				
1.	Solar based Improved power quality interleaved boost converter fed marine boat involving DC/Hybrid Drive	45.05	18.50	3.40	66.95
	Total	45.05	18.50	3.40	66.95

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He has also stated that in this case the prevailing Government Procurement Rules and Tamil Nadu Transparency in Tenders Act 1998 and Rules 2000 should be followed. He has requested to issue necessary sanction after duly obtaining detailed proposal from the Head of Departments and as per guidelines and procedures prescribed in the Governments Orders first and second read above.

2. The Registrar(i/c), Annamalai University in his letter fourth read above has sent a detailed proposal for the scheme of Solar based improved power quality interleaved boost converter fed marine boat involving DC /hybrid drive, as follows:-

OBJECTIVES

a) To run solar boats which helps to maintain un-spoilt natural habitats, as they produce no emissions, zero noise pollution, with little water disturbance or wash.
b) To drive the DC motor directly fed from the PV cell, by interfacing both through a well tuned interleaved DC-DC converter operating in boost mode
c) To achieve high efficiency interleaved converter involving low maintenance.
d) To provide wind turbine based refrigeration system to avoid degradation of sea food.
e) To optimize the capital cost by reasonable margin.
f) Make it user friendly with easier availability.
g) Use it as a viable alternative by replacing diesel combustible engine resulting in echo friendly environment.
h) To develop the proposed boat as pilot scheme for Faculty of Marine Sciences and analysis its utility, reliability, stability, economical viability and user friendliness and later commercialization can be thought off for fishermen of Cuddalore, Tamilnadu.

OUTCOME

The proposed boat is dual powered where in with rough sea and near sea shore the boat is operated with IC engine at its peak power to man over the rough sea and it gets converted to Sun Boat at mid sea with maximum saving in fuel. When IC engine is operated the solar power can be used to power the auxiliary device such as

- Refrigerator for cold storage
- Light loads of boat
- Battery charger which is back up source
- Dryer for drying fish

Also the techniques can be applied to propel the boat with dual prime mover.

Solar powered DC motors with interleaved boost DC-DC converter has higher up-front cost but low operating cost. However with genuine subsidy from government the capital cost can be optimized.

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INNOVATION / NOVELTY IN THE PROPOSED METHODOLOGY

a) Interlinking of renewable source directly with a marine boat driving DC motor load through power electronic interface involving a interleaved boost DC-DC convertor topology with improved performance measure resulting in highly regulated power source for boat.

b) Arriving at hybrid drive which is echo friendly with improved performance by connecting directly with solar system using above converter and indirectly also using battery banks.

c) Provision of wind turbine based refrigeration system involving buck boost converter for bulk storage.

END USER

The proposed work is planned as a pilot project for faculty of Marine Sciences and later after confirming its reliability the same may be implemented for fishermen community.

ENVIRONMENTAL BENEFITS AND IMPACT ON SOCIETY

a) Optimized carbon dioxide emission leading to reduced global warming.
b) Instant replacement of diesel boats resulting in huge saving of fossil fuel and foreign exchange.
c) Reduced degradation of sea food due to the refrigeration system involving wind turbine
d) Betterment of livelihood of fishermen.
e) Echo friendly environment, very quiet, no fumes, low vibration
f) No green house gas emissions and no water pollution
g) Development of acoustic proof system.
h) Substantial reduction in power burden of the existing grid.

BENEFITS OF PROPOSED PILOT PROJECT TO END USER OF FISHERMEN COMMUNITY

Fishing can be carried out both at sea shore or mid sea. sun boat can be effective only at mid sea only where sea is very calm and the fishing is resorted, it is no doubt that the sun boat powered by solar due to its calm and quite operation helps to have maximum catch when net is pulled or made to move at slow speed along with boat-the process of trawling which needs silent operation and slow speed (to avoid cut down of net). The collection of fish can be made maximum at mid sea and the duration of fishing can be extended to a maximum of one month for which effective refrigeration is required and as it is wind powered refrigeration more power can be saved. However the practical feasibility of the benefits to the end user can be concluded only after the successful implementation of the pilot project.

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ECONOMICAL BENEFITS

Apart from benefits of renewable energy the economical benefits

a) A comparison of solar boats with conventional boats shows that solar boats do not require any costs for fuel and lubricants. The boat could be self-sustainable, eliminating the cost of fuel altogether.
b) High torque at low rpm allows electric motors to turn larger propellers, known for higher efficiency.
c) Boats with cabin facility can also be installed with cold storage facility which can be powered through wind turbine.
d) Solar panels are highly reliable and easy to maintain. They have no moving parts, so visual checks and servicing are enough to keep systems up and running.
e) Solar panels produce as much as 80% of their potential energy on partly cloudy days and even on extremely cloudy days still produce 25% of their maximum output. So
f) Maintenance costs for the electric drive is low. Electric drives hardly ever have to be maintained.
g) In future there will be distinct cost advantages for solar boats since the costs of photovoltaic cells will further decline and diesel prices will increase considerably.
h) It is also possible to initially install a few photovoltaic cells and to extend the solar power capabilities later.
i) Electric drives are smaller and are of less weight than diesel engines and can be fit into smaller spaces, allowing for larger living spaces or storage compartments.

FINANCIAL OUTLAY

S.No.	Particulars	Cost in Rupees
1	Cost of cabin boat with IC engine including mould	18,00,000
2	Dual Propulsion	7,00,000
3	Electrical system – PV module	16,00,000
4	Electrical steering system	5,00,000
5	Fixation (Erection) for solar panel and transportation charges for boat	2,00,000

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6	2 DC motors (PMDC)	2,00,000
7	Cost of converter with controller	4,00,000
8	IC engine 10HP outboard model	1,00,000
9	DC Distribution Boards with DC MCB,DC Cables and control cables	1,25,000
10	Wind turbine system for refrigeration unit	6,00,000
11	Approval	1,50,000
12	Accessories and stationaries	1,50,000
13	Expertise advice from industries	1,00,000
14	TA/DA for acquiring expertise advice from industries	70,000
	Total	**66,95,000**

Total cost rounded off to Rs. 67 lakhs approx.

3. The Registrar (i/c), Annamalai University has requested to sanction a sum of Rs. 45.05 lakh from the total sanctioned amount of Rs.66.95 lakh for implementation of the above scheme for the year 2018 – 19.

4. The Government after careful examination, sanction a sum of Rs.45,05,000/- lakh (Rupees Forty five lakh and five thousand only) from the total sanctioned amount of Rs.66.95 lakh to Annamalai University for implementation of the scheme of Solar based improved power quality interleaved boost converter fed marine boat involving DC /hybrid drive under TANII - State Innovation Fund for the year 2018-19 to the Annamalai University.

5. The amount sanctioned in para – 4 above shall be debited under the following head of account:-

2202 - General Education - 03 Universities and Higher Education – 102 - Assistance to Universities – State's Expenditure KJ - Grants for the creation of Solar based improved power quality interleaved boost convertor fed marine boat involving DC/Hybrid Drive – Scheme under State Innovation Fund -309. Grants in Aid – 03 - Grants for Specific schemes.

(Old D.P.C.2202-03-102-KJ-09-34)
(IFHRMS: 2202-03-102-KJ-309-03)

6. The above expenditure shall be met from the State Innovation Fund by deducting under the following head of account:-

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2202 – General Education – 03 Universities and Higher Education – 902 - Deduct – Amount met from State Innovation Fund State's Expenditure – JD - Deduct – Amount met from State Innovation Fund – 330 - Inter – Account Transfer – 01 – Inter – Account Transfer.

(Old D.P.Code.2202-03-902-JD-3009)
(IFHRMS: 2202-03-902-JD-330-01)

And contra debiting J Reserve Fund (b) Reserve Funds not bearing interest – 8229-00-Development and Welfare Funds – 200 – Other Development and Welfare Funds – BE- State Innovation Fund – 802- Outgo – 02 – Not Bearing Interest.

DPC: (8229-00-200-BE-0006)
IFHRMS DPC: (8229-00-200-BE-80202)

7. Necessary additional funds will be provided in RE/FMA 2019-20. Pending provision of such funds, the Director of Collegiate Education, Chennai is authorized to draw and disburse the amount sanctioned in para 4 above. This expenditure should be brought to the notice of the Legislature by Specific Inclusion in the Supplementary Estimate 2019-20. The Director of Collegiate Education, Chennai is directed to include the expenditure sanctioned above, while sending the Budget proposal for RE/FMA 2019-20 and also to send necessary Explanatory Notes for including the above expenditure in the Supplementary Estimates 2019-20 to Finance (BG-I) Department without fail.

8. This order issues with the concurrence of Planning Development & Special Initiatives Department and Finance Department vide its U.O.No.2444/SPI/2019, dated 30.07.2019 and U.O.No.36351/Edn-I/2019, dated 09.08.2019 and ASL No.1143 (One thousand one hundred and forty three)

(BY ORDER OF THE GOVERNOR)

MANGAT RAM SHARMA
PRINCIPAL SECRETARY TO GOVERNMENT

To
The Vice-Chancellor / The Registrar (i/c) / The Finance Officer,
Annamalai University Annamalainagar.
Concerned individual (Through the Registrar, Annamalai University)
The Director of Collegiate Education, Chennai-6.
The Director of Local Fund Audit, Chennai-35.
The Accountant General, Chennai -18.
The Treasury Officer, Cuddalore District, Cuddalore.
The Sub-Treasury Officer, Chidambaram / Bills.
Copy to:
The Finance (Edn-I / B.G-I/ BG-II/ L&A Cell/ BPE/ BC) Department,
Chennai-9.

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The Resident Audit Officer [Office of the Principal Accountant General (G&SSA)], Tamil Nadu Secretariat, Chennai-9.
The Personal Assistant to Principal Secretary to Government, Higher Education Department, Chennai-9.
Additional Chief Secretary, Planning & Development
Chennai - 9
Member Secretary, State Planning Commission.
Ezhilagam, Chepauk, Chennai - 5
Sf/sc

// FORWARDED BY ORDER //

SECTION OFFICER.