

Annexure – 1

QUESTIONNAIRES

Questionnaire

The Questionnaire is for research study concerned with the recent market dynamics, support mechanism, Opportunities, competitiveness, weaknesses & challenges faced by various stakeholders, perception of stakeholders on Renewable Energy Projects, particularly grid connected ground mounted solar PV projects and onshore wind power projects to utilize optimally the available potential of renewable energy sources and development of renewable energy projects sustainably, within the India and the stakeholders opinion on such. Survey being carried out purely for the purpose of academic research and the strict confidentiality will be maintained. The name of the organization and person will not be disclosed to any one. The conclusions of the study would be based on the information provided by you to the great extent. However, Researcher would be glad to share the research outcome provided you desire.

Please complete and submit the response at earliest. Your time and cooperation is greatly appreciated.

Thank you.

1. Name of the Respondent: _____
2. E-Mail ID: _____
3. Designation: _____
4. Name of Organization: _____
5. State of the Respondent: _____
6. Total years of Experience:
 - a. Up to 2 Years
 - b. 2 to 5 Years
 - c. 5 to 10 years
 - d. More than 10 Years
7. Type of Organization:
 - a. Private
 - b. Public
 - c. Joint Venture
 - d. Government
 - e. Non-Government
8. How do you contribute to a utility scale renewable energy project: As a (please, specify).
 - a. Manufacturers
 - b. Supplier
 - c. EPC Contractor
 - d. Project Developer
 - e. Investor
 - f. Financier
 - g. Policy maker
 - h. Consultant
 - i. Power Purchaser _____
 - j. Independent power producer
 - k. Captive Users
 - l. Research Institution
 - m. Promoters of Renewable Energy
 - n. Renewable Energy Power Trader
 - o. If others, please specify _____

9. Please rate on scale how each one of the following stakeholders are responsible / contributor for the development of renewable energy projects (solar & wind).

Stakeholders	Strongly Agree	Agree	Don't Know	Disagree	Strongly Disagree
Manufacturers					
Supplier					
EPC Contractor					
Project Developer					
Investor					
Financier					
Policy maker					
Consultant					
Power Purchaser					
Independent power producer					
Captive Users					
Research Institution					
Promoters of Renewable Energy					
Renewable Energy Power Trader					

10. In how many sectors within the Renewable Energy basket you have been Operating:

- | | |
|---|--|
| a. On -Grid Connected Solar PV Power Projects | f. Floating Solar Power Projects |
| b. Off-Grid Conneced Solar PV power Project | g. Small Hydro Power Projects |
| c. On Shore Wind Power Projects | h. Bio mass projects |
| d. Off Shore Wind Power Projects | i. Concentrated Solar Thermal Power Projects |
| e. On grid Solar Wind Hybrid Projects | j. Geo thermal Power Projects |
| | k. Tidal Power Projects |
| | l. Waste to Energy |

11. Rate on a scale regarding “potential of Solar Renewable Energy in India”

	Strongly Agree	Agree	Don't Know	Disagree	Strongly Disagree
India has a tremendous potential of solar radiation					
Different state/area have different solar energy potential					
There is tremendous scope of solar Power project development					
The target of 100 GW of Solar power project will be achieved upto 2022					
Installation of solar power projects are growing at a speed as desired which may fully utilized the available solar resources potential of 750 GW					

12. Rate on a scale regarding “potential of Wind Energy in India”

	Strongly Agree	Agree	Don't Know	Disagree	Strongly Disagree
India has a tremendous potential of wind energy					
Different state/area have different wind energy potential					
There is tremendous scope of wind Power project development					
The target of 60 GW of wind power project will be achieved upto 2022					
Installation of wind power projects are growing at a speed as desired which may fully utilized the available wind resources potential of 310 GW					

13. Rate: 1- Available more than target requirements, 2- Sufficiently Available to meet the target requirements 3- available less than target requirements, 4- Not available at all 5- Not known

What do you say about the available RE potential for achievement of Govt. target.	1	2	3	4	5
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14. Rate: 1-Very Important, 2-Important, 3-Neutral 4- Less important, 5- Not at all Important

Rate your opinion on scale to support for the achievement of government target of Renewable Energy Projects.	1	2	3	4	5
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15. How important for your organization to support for the achievement of government target of following Renewable Energy Projects. (please rate by tick mark)

	Very high (80% or more)	High (50% - 80%)	Moderate: (50% - 20%)	Low (less than 20%)	Not significant
Solar PV Power projects					
Wind Power Project					

16. Considering Renewable Energy Projects sector, how significant it for your organisation to install renewable energy projects in order to utilize optimally the available potential of renewable energy source in the following sectors. (please rate by tick mark)

	Very high (80% or more)	High (50% - 80%)	Moderate: (50% - 20%)	Low (less than 20%)	Not significant
Solar PV Power projects					
Wind Power Project					

17. Rate the following factors influencing the decision of installation of renewable energy (Solar & Wind) projects

	To a very great extent	To a great extent	To a moderate extent	To some extent	Not at all
Payment security mechanism					
Centre level policy supports					
State level policy support					
Easy of procedure for RE project					
Land policies					
Low cost funding from Government institutions					
Low cost funding from Private Banks and Institutions					
Policy for disposal of solar panels					
Availability of facility for disposal of solar panel					
Development of Solar Parks at different states					
Waiver of transmission & wheeling charges					
Renewable Purchase Obligation (RPO)					
Exemption of custom duties					
Imposition of safeguard duty					
Availability of renewable energy resources					
Availability of off takers					
Availability of evacuation facility					
Market competition					
Government target for RE capacity					
Supply chain network					

18. Rate the factors restricting the installation of renewable energy projects

	To a very great extent	To a great extent	To a moderate extent	To some extent	Not at all
Government target					
Policy implementation					
Renewable Purchase obligation					
Policy of land for solar & wind Project					
Transmission infrastructure facility					
Power purchase issues					
Market competition					
Custom & safeguard duty					
Non-Availability of lands					
Inadequate material supply					
Awareness & skill manpower					

19.Rate the following constraints for Renewable Energy project capacity development with respect to available RE potential

	To a very great extent	To a great extent	To a moderate extent	To some extent	Not at all
Acquisition					
State Development Energy Authority registration, Approval and inspection of project					
Supply chain issues					
Transmission infrastructure availability & Evacuation facility					
Taxes and duties like Custom duty, safeguard duty, variable taxes					
DISCOM Payment issues					
Financing issues					
Non availability of solar parks					
Off-takers issue					
General issues					

20.how far the existing policies and supports helps in developing and achieving the government target particularly solar PV target of 100GW & wind target of 60GW respectively.

	To a very great extent	To a great extent	To a moderate extent	To some extent	Not at all
100 GW Solar PV Projects					
60 GW Wind Power Projects					

21.Do you agree that development of renewable energy projects creates opportunities of green employment to boost the India`s developing economy

	YES	NO
Solar PV Power Projects		
Wind Power Projects		

22.If yes, tick mark the approximate nos of green employment generation upto life cycle of utility scale renewable power projects capacity addition

	Less than 10 job-year per MW	11 to 15 jobyear per MW	16 to 20 jobyear per MW	21 to 25 jobyear per MW	26 to 30 jobyear per MW	More than 31 job-year per MW
Solar PV Power Projects						
Wind Power Projects						

23. To what extent the following policies help to promote the government target for development of Renewable (Solar & Wind) energy projects.

	To a very great extent	To a great extent	To a moderate extent	To some extent	Not at all
Accelerated Depreciation					
Feed in Tariff					
Preferential Tariffs					
Generation Based Incentives (GBI)					
Exemption from custom duty					
Renewable Energy Certificates					
Renewable Generation Obligation					
No inter-state transmission charges					
Viability Gap Funding					
Central Financial Assistance					
Imposition of Safeguard duty					
Budgetary support for R&D and demonstration of technology					
Income tax holidays					
Competitive bidding process					
Foreign Direct Investment					
Funding from government institutions for financing term loan					
Introduction/revision of solar policy					
Enforcement of Renewable Purchase Obligation					
Hybrid solar wind policy					
Policy for revamping of existing solar-wind projects					
Payment Security mechanism					
Off-takers- Power Purchase Agreement					

24. To what extent the following as the opportunity for the development of Renewable Energy Projects

	To a very great extent	To a great extent	To a moderate extent	To some extent	Not at all
Government mandate for target					
Renewable Energy Resource Potential					
Renewable Purchase Obligation (RPO)					
Policy & Regulatory supports					
Waival of inter-state transmission charges					
Domestic manufacturing facility					
Duty free Supply chain from other countries					

25. Please opine what percentage of RPO is to be enforced for achievement of government target of 175 GW by 2022.

10 to 12%	13 to 15%	16 to 18%	19 to 21%	21 to 24%	More than 25%
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26. To what extent the following challenges / barriers affect for the developments of utility scale renewable energy projects

	To a very great extent	To a great extent	To a moderate extent	To some extent	Not at all
Technology Development					
Supply chain issue					
Taxes and duties					
General Infrastructure development					
Geographical and ecological barriers					
Lack of knowledge and awareness of technologies barriers					
Financial and economical barriers					
Policy & regulatory barriers					
Market related barriers say lack of business model, Lack of defined market					
Initial investment / upfront cost					
Transmission infrastructures development					
Land acquisition issues					
Political issues					
Forecasting & Scheduling / DSM					

27. Is there any difference for utility scale renewable energy project developments at various regions in terms of following factors?

	Very large Difference	Large Difference	No difference at all	Less Difference	Very less Difference
Regional RE resources / potential					
State Policy					
State Regulations					
Regional Challenges					
Regional Barrier					
Ease of doing business					
Payment Security					
Awareness & Capacity building					
Forecasting & scheduling/DSM penalty					

28. To what extent the following govt policies are supportive for investment in utility scale renewable energy projects.

	To a very great extent	To a great extent	To a moderate extent	To some extent	Not at all
Amendment in tariff policy 2015 (Reduction in tariff cost)					
Waiver of transmission charges (Promoting grid connectivity)					
Financial support from government institutions					
Defined Renewable Purchase obligation (RPO)					
Promoting Research & Development					
Promoting expansion of market					
Repowering policy					
Import taxes, Custom duties, Safeguard duties					
Financial and Promotional Initiatives					
Promoting supply chain from other countries					
Removal of feed in tariff					
Introduction of competitive bidding					

29. Which policy you propose for supporting the investment in utility scale renewable energy projects

- | | |
|--|--|
| a. Payment Security mechanism | g. Establish important promotional policy |
| b. Land Acquisition policy | h. Competitive bidding process |
| c. Infrastructure development policy | i. Connectivity at Project site |
| d. Policy and other regulatory support mechanism | j. Solar park policy |
| e. Establishment of Green corridor | k. If others, _____ |
| f. Foreign Direct Investment (FDI) relaxed policy | _____ |

30. To What extent the following policies & regulatory level barrier affect the development of utility scale renewable energy projects to utilize available potential of RE potential

	To a very great extent	To a great extent	To a moderate extent	To some extent	Not at all
Policy barriers					
Regulatory barriers					
Support mechanism barriers					
Political barriers					
Environment barriers					

Land policy barriers					
Power purchase policy					
Institutional & Administrative barrier					
Public acceptance barrier					
International Trade barrier					

31. To what extent the functional and operational level barrier & challenges affect the development of utility scale renewable energy projects to utilize available potential of RE potential

	To a very great extent	To a great extent	To a moderate extent	To some extent	Not at all
Financial challenges					
Evacuation issues					
Costing barriers					
Competition barriers					
Technical barriers					
Infrastructure barriers					
Investment barriers					
Awareness & capacity development barriers					
Sale of power barriers					
Forecasting & scheduling barrier					
Land acquisition barrier					
Deviation Schedule Mechanism (DSM) penalty barrier					
Supply chain barrier					

32. What are the current challenges / barriers in installing renewable energy projects for your organization?

	To a very great extent	To a great extent	To a moderate extent	To some extent	Not at all
Distribution & transmission facilities					
Frequent changes in state policies					
Difficulty in funding project					
Financing cost					
Reduced tariff					
Variable output					
Initial investment					
Market Competition					
Cost Competition					
International trade issues					
Competitive bidding process					
Local Taxes & duties					
Safe guard & anti dumping duties					
Domestic Content Requirement (DCR)					

33. As per your perception, pl rate the following general barriers that affect development of utility scale renewable energy projects both solar & wind

	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
Frequent changes in state level regulations					
Difficulty in finding buyers for generated electricity					
Investment cost					
Operation & Maintenance					
Seasonal availability of renewable resource					
Distribution companies not willing to buy beyond Renewable Power Obligation (RPO)					
Process for obtaining Renewable Energy Certification (REC)					
Wheeling & supervision charges.					
Procedure for permission, registration Etc					
Procedure for connectivity					

34. What are the procedural issues encountered in development of utility scale renewable energy projects in India?

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35. Which range of project costing is viable for the utility scale renewable energy projects capacity in MW AC in India?

	6 to 5.5 Cr per MW	5.5 to 5 Cr per MW	5 to 4.5 Cr per MW	4.5 to 4 Cr per MW	4 to 3.5 Cr per MW	3.5 to 3 Cr per MW
Grid connected Solar PV power projects						
Onshore Wind power projects						

36. How sensitive the market competition for the development of utility scale renewable energy projects.

	Extremely High Sensitive	Highly Sensitive	Neutral	Less Sensitive	Not at all sensitive
Utility Scale Solar Power Project					
Utility Scale Wind Power Project					

37.How sensitive the cost competition for the development of utility scale renewable energy projects.

	Extremely High Sensitive	Highly Sensitive	Neutral	Less Sensitive	Not at all sensitive
Utility Scale Solar Power Project					
Utility Scale Wind Power Project					

38.What is your perception regarding the initial cost of the setting up of renewable energy projects

	Very High initial Cost	High initial Cost	Normal initial Cost	Low initial Cost	Very low initial Cost
Utility scale solar PV power projects					
Utility scale wind power projects					

39.What do you think about the Operation & maintenance cost of the renewable energy projects

	Very High Cost	High Cost	Normal Cost	Low Cost	Very low Cost
utility scale solar PV power projects					
Utility scale wind power projects					

40. Which kind of assistance/support expected from the government for development of renewable energy projects in India?

- | | |
|---|--|
| a. Financial Assistance | i. Procedural assistance |
| b. Supportive Policy assistance | j. Right of ways support |
| c. Purchase of power assistance | k. supply chain assistance |
| d. regulatory assistance | l. Custom duties & taxes waiver |
| e. Capital subsidy assistance | m. Anti dumping/safeguard duty waiver |
| f. Land acquisition support | n. Waival of inter-state transmission charges |
| g. Transmission infrastructure support | o. If others, _____ |
| h. Assured connectivity at all locations | |

41. Which kind of subsidy/incentives available at present from the government for development of renewable energy projects in the India?

- a. Green Certificate
- b. Support in the form of power purchase agreement
- c. Support in the form of payment mechanism
- d. Assistance in the form of loan
- e. Subsidized project grant
- f. Low cost loans
- g. supply chain support
- h. custom duty waiver
- i. Anti dumping waiver
- j. Waival of inter-state transmission charges
- k. If others, _____

42. To what extent the following points contribute to make utility scale renewable energy (solar & wind power) project more affordable and viable

	To a very great extent	To a great extent	To a moderate extent	To some extent	Not at all
Government should provide more subsidy					
Invest more in R&D for technology development					
Promote domestic manufacturing capacity					
Implementation of policies					
Secured payment mechanism					
Power Purchase Agreement with Off-takers/DISCOM					
Waival of inter-state transmission charges					
Facilitate international trade					
Facilitate supply chain management					
Must Run status to RE power					
Waival of taxes & duties					
Awareness and capacity building					

43. How would you rate the criticality of each of the mentioned risks when it comes to investment in utility scale renewable energy projects say solar/wind power projects

	Extremely Critical	Very Critical	Critical	Less Critical	Not critical at all
Regulatory Risk					
Construction Risk say Time over run & cost over run					
Counter Party Risk say Construction Contractor, O&M Contractor					
Financial Risk					
Investment Risk					
Power Off Taker Risk					
Resource assessment Risk					
Force Majeure Risk					
Deviation Schedule Mechanism (DSM) penalty Risk					

- 44.** To what extent the following motivation support behind the decision on investing in utility scale renewable energy (solar & wind power) project?

	To a very great extent	To a great extent	To a moderate extent	To some extent	Not at all
Renewable power are the future					
Returns on generations					
Congential policies in renewable energy at state level					
High tariff rates					
Provision of Renewable Energy					
Certification					
Government targets for renewable energy development					
Lower operating cost					
Secured payment mechanism					
Availability of renewable energy resources					
Open access / third party sale of power					

- 45.** So far as grid connectivity for evacuation of the generated RE power is concern, pl rate to what extent the following points affect the evacuation issues related with.

	To a very great extent	To a great extent	To a moderate extent	To some extent	Not at all
Inadequate transmission infrastructure					
Mismatch between the available corridor and necessary demand centres					
Procedure for connectivity permission					
High cost of establishment of transmission lines					
Right of Way (RoW) issues					
Transmission system Supervision charges					
Wheeling & transmission charges					

- 46.** Rate: 1- more than sufficient 2- Sufficient 3- Less sufficient 4- Very less sufficient 5- Not sufficient

As per your experience, pl tick that the manufacturing capacity in India for major/main component of the utility scale renewable power projects are adequate to meet the increasing demand/ target set by government of India.	1	2	3	4	5
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47.For execution of the utility scale renewable energy projects, pl rate the important the value chain, logistic, delivery of the materials at project site

	Very important	important	Less important	Very less important	Not important
Utility scale solar power project					
Utility scale Wind power project					

48.Rate: 1- very high cost 2- High cost 3- Equal cost 4- Low cost 5- Very low cost

Rate the cost comparison for procurement of materials from India & abroad.	1	2	3	4	5
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49.From which country will your organization prefer to import main components for following renewable power projects?

Solar Power Projects	
Wind Power Projects	

50.In case for import of RE project component from other countries, pl rate the effectiveness of value chain, logistic, delivery schedule for project.

	Highly Effective	Effective	Less Effective	Very less effective	Not effective
Utility scale solar power project					
Utility scale Wind power project					

51.Which of the initiatives, as per your opinion shall be implemented for aggressive development of renewable energy projects to utilize optimally the available renewable energy resources?

- | | |
|---|--|
| a. Government mandated approach | f. Time based incentive approach |
| b. Top down approach | g. Low cost long term loan |
| c. Outcome based incentive approach | h. Market enabled research approach |
| d. Incentive for domestic manufacturing capacity | i. Awareness & capacity building approach |
| e. Incentive for technology development | j. Bottom up Approach |
| | k. If other, _____ |

52.What would you suggest to utilize optimally the available potential of renewable energy resources and development of renewable energy projects?

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Thanks again for giving your valuable time to answer this questionnaire.

Annexure – 2

RESEARCH PUBLICATION



THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

PUBLICATION CERTIFICATE

Name of Ph.D. Supervisor Dr.UMESH RAJNIKANT DANGARWALA

Published Articles/Papers in Journals

Sr No.	Author(s)	Paper Title	Journal Name & ISSN & Volume No.	Published Year	DOI	Index in Scopus/UGC CARE/Clarivate	Document Submitted?
1	Mr. Dignesh Panchasara and Dr. Umesh Dangarwala	SERVICE QUALITY AND SATISFACTION OF STUDENTS: A STUDY OF SELECTED SELF FINANCE COLLEGES IN ANAND	Journal Name: Towards Excellence UGC-HUMAN RESOURCE DEVELOPMENT CENTRE Gujarat University, Ahmedabad-380009, Gujarat, India, ISSN: 0974035X, Volume No.: 13	1-6-2021		In Scopus: Yes, In UGC CARE: Yes, In Clarivate: Yes	Submitted
2	Dr. Umesh R. Dangarwala & Mr. Kahar Ramnarayan	A REALISTIC GLIMPSE INTO INDIA'S ENERGY SECURITY IN FORESEEABLE FUTURE IN VIEW OF RENEWABLE ALTERNATIVES	Journal Name: Research review: international journal of multidisciplinary, ISSN: 2455-3085	1-3-2019		In Scopus: Yes, In UGC CARE: No, In Clarivate: No	Submitted
3	Dr. Umesh R. Dangarwala & Mr. Dignesh S. Panchasara	A study of service quality dimensions and satisfaction of selected students of universities in vadodara	Journal Name: International journal of research, ISSN: 2236-6124	1-3-2019		In Scopus: Yes, In UGC CARE: No, In Clarivate: No	Submitted
4	Dr. Umesh R. Dangarwala & Ms. Jaspreet B. Minhas	Purchase Behaviour of Consumers Durable Goods (A Case Study of Selected Union Territories-Daman & DNH)	Journal Name: RESEARCH REVIEW International Journal of Multidisciplinary, ISSN: 2455-3085, Volume No.: 3	1-5-2018		In Scopus: Yes, In UGC CARE: No, In Clarivate: No	Not Sumbitted
5	Dr. Umesh R. Dangarwala & Ms. Krupa J. Rao	Online Education and E-Learning Scenario in India	Journal Name: RESEARCH REVIEW International Journal of Multidisciplinary, ISSN: 2455-3085, Volume No.: 5	1-5-2018		In Scopus: Yes, In UGC CARE: No, In Clarivate: No	Not Sumbitted

6	Dr. Umesh R. Dangarwala & Ms. Krupa J. Rao	Literature Review: Awareness about the Social networking sites amongst various generations	Journal Name: International Journal of Novel Research and Development, ISSN: 2456-4184, Volume No.: 3	1-3-2018	In Scopus: Yes, In UGC CARE: No, In Clarivate: No	Not Sumbitted
7	Dr. Umesh R. Dangarwala & Ms. Krupa J. Rao	A Literature Review : Niche marketing in India	Journal Name: International Journal of Creative Research Thoughts, ISSN: 2320-2882, Volume No.: 6	1-3-2018	In Scopus: Yes, In UGC CARE: No, In Clarivate: No	Not Sumbitted
8	Dr. Umesh R. Dangarwala & Mr. Dignesh S. Panchasara	Impact of Celebrity Brand Endorsements on Brand Image and Product Purchases of the Soft Drink Products	Journal Name: MANAGEMENT GURU, ISSN: 2319-2429, Volume No.: 5	1-1-2018	In Scopus: Yes, In UGC CARE: No, In Clarivate: No	Not Sumbitted

Paper Presented in Conference/Symposia/Seminar

Sr No.	Authors	Paper Title	Paper Theme	Organising Body	Date of Publication	Documents Submitted?
1	Dr. Umesh R. Dangarwala	Societal changes v/s Sustainable Business Development	Sustainable development in Business along with Societal Changes	R. J. Tibrewal Commerce College and Universities Commerce & Management Teachers' Association	10-3-2019	Not Submitted
2	Dr. Umesh R. Dangarwala	Evaluation of Privatization of Higher Education	Higher Education: Current Scenario and Direction	Achala Education Foundation Trust	21-1-2018	Not Submitted
3	Dr. Umesh R. Dangarwala	Quality Techniques & Higher Education System in India	Higher Education and New Development	Swami Sahajanand College of Commerce & Management	18-12-2017	Not Submitted
4	Dr. Umesh R. Dangarwala	Liberalization of Insurance Sector: New Dimensions	70th All India Commerce Conference of ICA	Indian Commerce Association	12-10-2017	Not Submitted
5	Dr. Umesh R. Dangarwala	Skills Development & Its Different Aspects	Vocational Studies: Skill, Entrepreneurship, Employability and Labour Market	C P Patel & F H Sha Commerce College, Anand	20-3-2017	Not Submitted
6	Dr. Umesh R. Dangarwala	Contribution of Value education & Human Development in India	Human development: Issues and Challenges in India	G. H. PATEL POSTGRADUATION INSTITUTE OF BUSINESS MANAGEMENT (MBA PROGRAMME), SARDAR PATEL UNIVERSITY	21-1-2017	Not Submitted

I Undersign, agree that all submitted information in above format is true as per my knowledge and belief.

Dr.UMESH RAJNIKANT DANGARWALA

Annexure – 3
PLAGIARISM REPORT

Ph.D. Thesis

ORIGINALITY REPORT

2%

SIMILARITY INDEX

MATCH ALL SOURCES (ONLY SELECTED SOURCE PRINTED)

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