



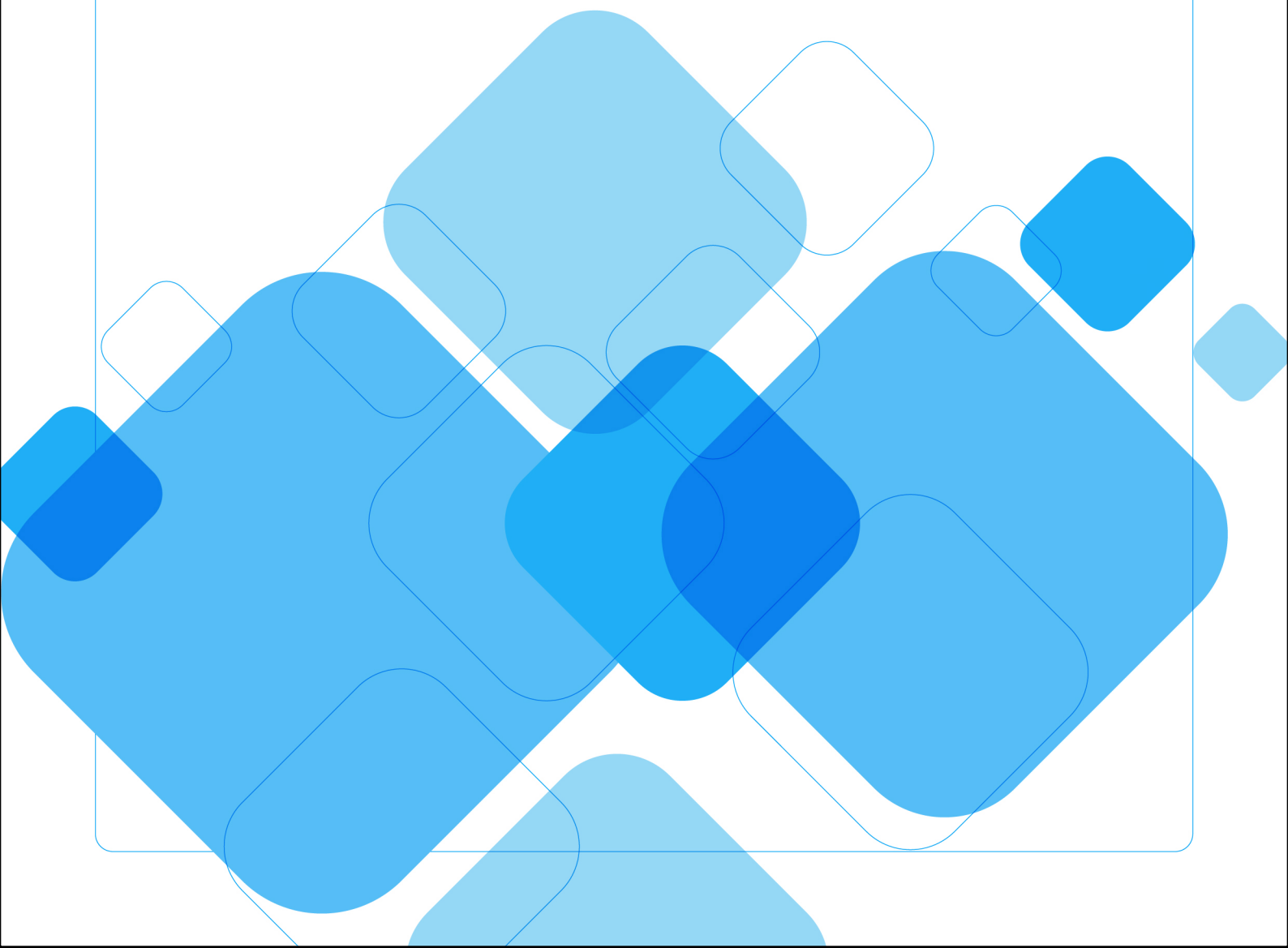
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# Research Proposal Service



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## Order Information

**Order code:** HTS-SAM-002-2020

## Research Proposal Summary

Title	Nontechnical Barriers to the Use of Solar Energy and Other Renewable Energies: A Masdar City Case study.
Service Type	Research Proposal Service, Elite.

## Background

**Overall research aim** (i.e. the central goal of your research, what you intend to achieve)

The primary aim of adopting renewable source of energy is to generate a low-carbon economy ensuring a continuous availability of energy for power generation like electricity. Though renewable technologies are advancing, its application remains to be low when compared to the technological growth in Masdar City (NSSPI Newsdigest, 2012). This, as per news agencies is the first zero-waste and carbon neutral city currently under construction, while carbon-neutral dwellings already exist in the world like Jühnde village in Germany. However, Masdar is different in that, it is a larger scale project and deems to accommodate 90,000 people with 40,000 residents and 50,000 daily visitors (Reiche, 2010).

Energy consumption projection from 2006 to 2030 shows that energy utilization has increased by 44% in a period of 25 years. It is expected that specifically in the Middle East, energy demand will increase from 6,975,000 GWh in 2006 to 11,049,000 GWh in 2030 which is a 58% increase (Jones, Mola, & Elkins, 2007). Consequently, researchers have estimated 100GW more power generation to meet the projected future demand (2007 – 2017). This situation is expected to increase the interest in identifying more sustainable alternatives like a renewable source of energy or hybrid energy

generating systems to meet the requirements. It is being realized that availability of fossil fuels is declining and hence renewable sources of energy should be developed before fossil fuels completely deplete. Sunlight is ample throughout the year in the Middle East which makes it possible and reasonable to utilize solar power by Gulf Corporation Council (GCC) regions.

For example, an extant study conducted in UAE identified that energy consumption per area in households is relatively high compared to similar households in Europe (Taleb & Pitts, 2009). However, the current situation is not optimal for GCC since it lags behind in global initiatives to adopt renewable sources of energy for reasons like political unrest, unstable financial situation, lack of adequate knowledge and other social issues. For this reason I intend to explore options of identifying the potential to increase renewable source of energy in the GCC region (Bachllerie, 2012). In this respect the first level of changes required include reducing environmental footprints and elevating sustainability by creating awareness followed by eliminating non technical barriers like lack of government support, consumer knowledge, optimising financial facilities, law and order and variations in type of utilization (Harmsen, Wesslink, Eichhammer, & worrell, 2011). The study is focused on establishing positive change to implement renewable energy source like increasing social awareness, examining non-technical barriers in using solar energy for Masdar City.

**Specific research objectives, research questions or research hypotheses** (i.e. elaborate on your research aim by identifying relevant research objectives, questions or, where appropriate, hypotheses)

## Research Objectives

- i) To explore the consumer perceptions of solar energy applications
- ii) To identify non-technical barriers towards the adoption of solar energy
- iii) To assess the interest in solar energy as a renewable energy among government authorities of Masdar renewable energy

## Research Questions

RQ1: What are the non-technical barriers towards applying solar energy in Masdar City?

RQ2: What are the solutions to these non-technical barriers and how can those be applied to enhance the development of renewable energy in Masdar city?

**Context and rationale for the research topic** (i.e. briefly explain why your topic is of interest, identify the academic/ applied debates relevant to your topic, and importantly, explain how your proposed research seeks to advance current understanding)

Several studies have been conducted with reference to non-technical barriers and its applications in developed countries. For an instance, a study was conducted by Kelly (2011) in New Zealand identify the present status of renewable energy technologies and the barriers for growth. The study described the factors that contribute to replace fossil fuels and option of biomass energy. However, renewable sources of energy has developed in Europe and America while it still lags behind in African and Asian countries. Studies were conducted to compare renewable energy problems with respect to electricity generation in the Middle East (Mostafaeipour & Mostafaeipour, 2009). Related researches have become of interest in Iran since there is diverse renewable source of energy available and scope for implementation. However, there are many hindrances to tapping the energy to its full extent. Lokey (2009) put forth the clean development mechanism (CDM) to ensure harnessing complete potential of renewable energy. This would help circumvent issues like market limitations for energy producers and barriers from state-run electricity producers. There seems to be a disconnect between power generation and how it is viewed by the public. The disconnect leads to misinformation with respect to values of energy consumption, trust, abundance, control, and the liberal American perception of energy utilization (Sovacool, 2009). Accordingly, Schroeder (2009) analysed the methods to increase clean energy systems and explained the effective contribution of CDM to deploy renewable energy in China. He also supported the introduction of a proper national regulation which can optimally commercialize renewable energy for which CDM financing is of utmost importance.

GCC countries apparently face many problems with implementation of renewable energy (Patlitzi-  
anas, Doukas & Psarras, 2006) and these barriers are classified into three: Policy legislation, Market technology and Finance. These three barriers are related to either the institution or infrastructure. Researchers point out that the major obstacles in implementing renewable energy are related to high investment requirement, inadequate technological and commercial skills, lack of efficient policy framework, inefficiency in proper evaluation of fuel price and non-inclusion of external expenses involved.

The conceptual framework that will be employed for this study will be same as Trudgill's (2010) framework for analyzing barriers. Trudgill's framework included six major obstacles including knowledge, agreement, technological, social, economic and political. This will also facilitate peer review of the various non-technical obstacles given by Trudgill which are knowledge, agreement, technological, social, economic and political. Similar to Trudgill, non-technical barriers were identified for detailed analysis and discussions by another group of researchers (Haw, Sopian, Sulaiman, Hafidz &

Yahaya, 2009) with respect to the situation in Malaysia and Kuala Lumpur using a direct interview and structured questionnaire method. In this study, the researchers were able to perform a field survey for a foundation to assess nontechnical barriers in employing an Integrated Photovoltaic Program in the domestic building of Kuala Lumpur. Therefore, using Trudgills' framework also called AKTESP barriers can be expected to augment social change in North Africa and Middle Eastern countries, especially in Masdar City.

While conducting the study it is recognized that AKTESP barriers may not be present for all countries and the factors may in some situations overlap with each other (Farhar & Buhrmann, 1988). These exceptions are as follows:

1. Agreement barriers include ambiguity of situations, understanding a situation but denial of the issues, indentifying the problem but rejecting associated issues, and accepting the problem without adequate actions.
2. Knowledge barriers include sufficient knowledge but inefficiency in implementation, and inadequate communication.
3. Technology barriers include insufficient technological access, lack of knowledge and technology availability but lack of technology updates.
4. Economic barriers include financial problems, economic inappropriateness, economic denial and financial exploitation.
5. Social barriers include social leadership, social resistance, social value systems, social moral practices and social allocation.
6. Political barriers include political cynicism and political ideology.

With respect to barrier determination, every stage includes questions regarding the causes of an obstacle in the process of identifying a solution. The first obstacle would be agreement since any barrier in this factor will have a negative effect on the whole process. Post solving problems in agreement, the amount of knowledge available is assessed. However, only knowledge and agreement is not enough to implement an idea without technology. Likewise, there are other problems like cost of technology, social resistance, lack of political support etc (Trudgill, 2010). Accordingly, the non-technical barriers in GCC has to be identified.

**Nontechnical barriers in GCC.** Non-technical barriers are predominant in implementing renewable energy plans in GCC. These barriers are:

**Market technology:** First problem is associated with dispatch considering the utility grids. Power generation from natural source may not be able to provide adequate levels of dispatch which requires alterations in the procedure of utility dispatch. There is no government supported market strategy, there is lack of skills in terms of commercial availability and lack of awareness and experience in rural areas.

**Policy legislation:** Lack of proper policy framework and strategies is one of the major drawbacks of all Arab states. Since there has been abundant fossil energy in the Gulf countries not much importance had been given to non-renewable source of energy (Mezher et al., 2011). Institutions that depend on conventional power, exercise political subversion which is an important obstacle in development of renewable energy (Beck & Martinot, 2004). All Gulf countries ratified UN framework convention between 1994 and 1996 (UNFCCC, (United Nations Framework Convention on Climate Change), 2009).

**Cost:** There is no adequate subsidies for renewable energy sources in the regional energy producers. Current scenario is that subsidies are provided for conventional energy source but not for non-renewable energy production which makes their competition in the market weak (Kazem, 2011). In the GCC nations, O&G power generation is well subsidized making cost and risks associated with renewable energy is high (Patlitzianas et al., 2006). Rapid developments in the Gulf has increased demand for energy (Bachllerie, 2012). Carbondioxide emission is the highest in Kuwait, Qatar and UAE (CDIAC, 2012).

Due to scanty of research on Non-technical barriers in UAE especially in Masdar city, the present study will test this framework.

**Research approach and methods** (i.e. briefly describe how you intend to research your proposed topic, identifying relevant research methods/and techniques, such as data collection methods and data analysis techniques, that will allow you to achieve your research aim and objectives)

Research methodology primarily involves the data collection method (Bryman, Teevan, & Bell, 2009). Three types of data collection methods include qualitative, quantitative, and mixed methods. Data when presented in words it is qualitative method and when presented in numbers it is quantitative method. Mixed approach employs both. In this study, researcher adopted quantitative method and deductive method of data collection where questionnaire will be developed based on the Trudgill Framework. Using the survey methodology, questionnaire will be administered to the consumers.

**Sampling and Sample size:** A non-random or non-probability sampling which is a purposive sampling method will be appropriate for this study. Purposive sampling refers to environment, participants and activities are deliberately chosen to obtain information which can not be provided by other options (Maxwell, 2009). In this study, researcher will adopt convenience sampling method to recruit consumers. The sample size adopted for the present study would be around 100 consumers from Masdar city. In addition, 10 experts will be questioned on the feasibility of solar energy projects in Masdar city. The study will ensure reliability and validity during the data collection process. Reliability of results depends on the trustworthiness of respondents (Tracy, 2010). I chose participants who are familiar with the topic but the reliability is in question because crosschecking (Tracy, 2010) is important to present data that is dependable. So, responses will be compared with secondary data. Validity of study depends on the study design to measure the data (Marshall & Rossman, 2011; Tracy, 2010).

**Sources and key references** (i.e. identify the key relevant academic literature and any relevant data sources)

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**Anticipated problems** (i.e. identify any potential problems which you might encounter in undertaking your research, and describe how you plan to overcome or minimise these problems)

STAMP

I will ensure my personal bias will not be affect the interview process in a way that could influence the response of the participant. The data collection process will be conducted after obtaining consent from participants after clearly explaining the benefits of the study and withdrawal processes.

**Do envisage encountering any elevated risk during the undertaking of your dissertation fieldwork?**

**Yes / No** (delete as applicable)

If yes you may be required to fill out a risk assessment form at a later date.

**Comments from supervisor**

**Aims and objectives**

**Research methods and data sources**

## Awareness/ understanding of key literature sources

Empty text box for awareness/ understanding of key literature sources.

## Relevance of proposed research, contribution to knowledge

Empty text box for relevance of proposed research, contribution to knowledge.

## Other general comments (feasibility of proposed research, etc)

Empty text box for other general comments (feasibility of proposed research, etc).