"Development of Web-GIS Tool for estimating the Rooftop Solar Power potential for Indian Solar Cities"

INDIA GEOSPATIAL FORUM

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HICC, Hyderabad, India

Er. Alekhya Datta
TERI, New Delhi

Study Objective

Creating Innovative Solutions for a Sustainable Future

To develop a high performing and flexible Web-GIS tool to estimate the rooftop solar power potential for a city.

Phase I: Chandigarh Area

Study Area

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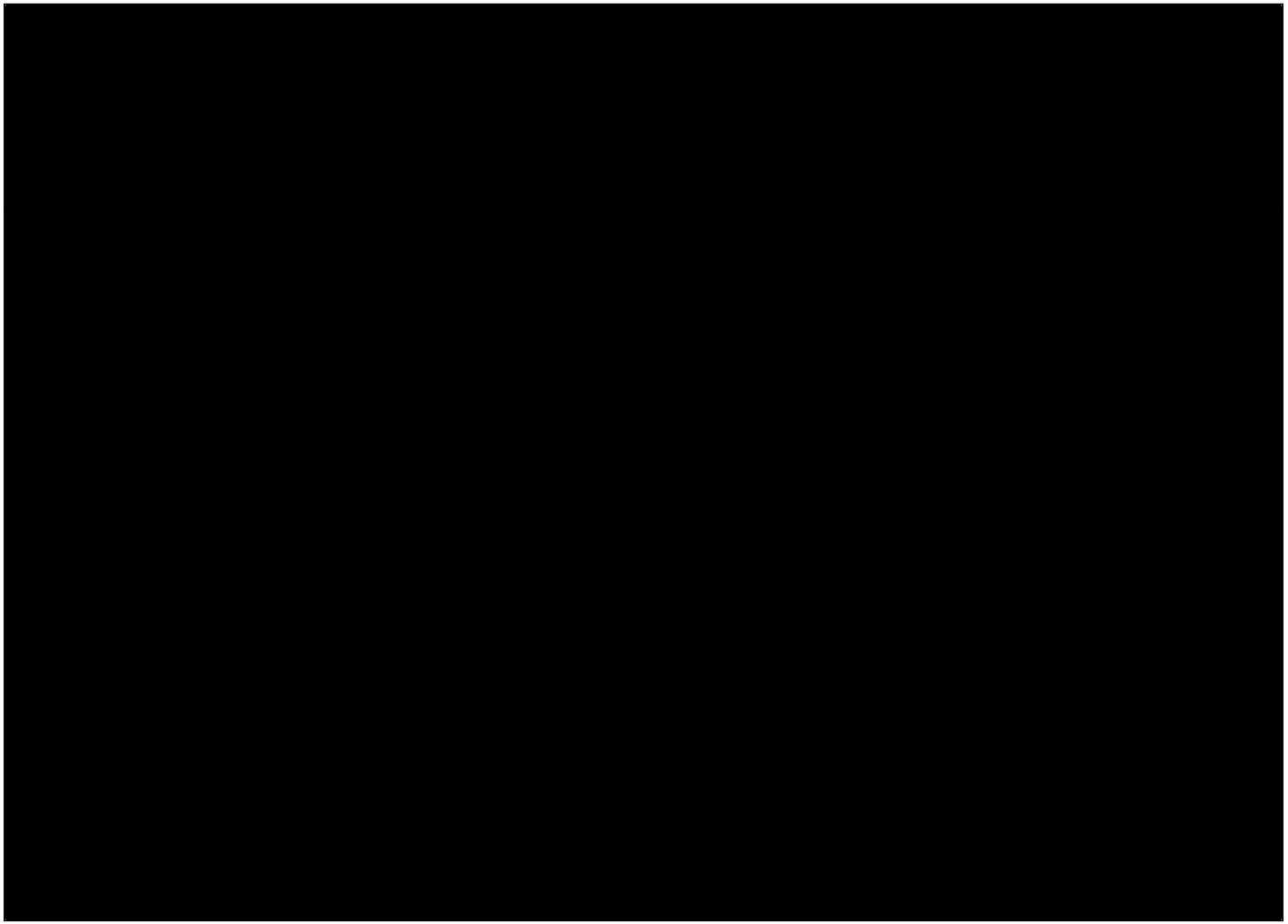
Pleiades-1A

Source: Google Earth (http://www.google.com/earth/index.html)

Source: http://www.astrium-geo.com/pleiades

Pleiades Satellite Imagery

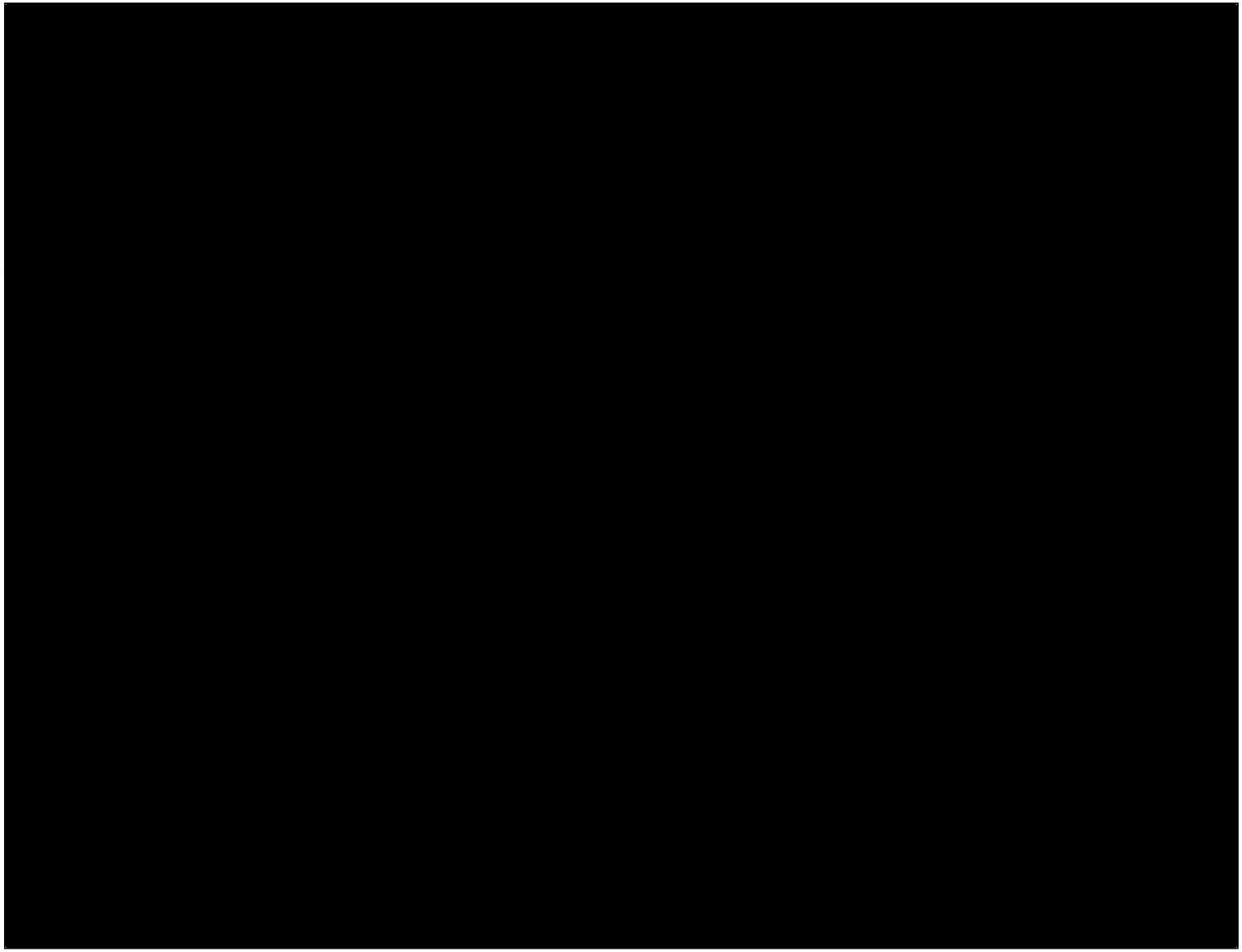
Pleiades Satellite Imagery Coverage: Chandigarh Area



Methodology

GIS Data-sets for Chandigarh Area (Building Rooftop)

Digital Surface Model (DSM) for Chandigarh



Solar Radiation Analyst

ESRI ArcGIS Solar Radiation Tools:
http://resources.arcgis.com/en/help/main/10.1/index.html#/An_overview_of_the_Solar_Radiation_tools/009z000000t4000000/

Rooftop Area and Solar Radiation

Analysis Results: Chandigarh Area

- ✓ **Total Buildings Surveyed (Nos.): 14,000 (approx.) ##**
- ✓ **Total Rooftop Digitized (Nos.): 1,10,500 (approx.) ##**
- ✓ **Potential Roof Area (70%) for Solar PV (Area > 10 Sq-M && GHI > 4kWh/m2/Day): 4 Sq-Kms. (approx.) ##**
- ✓ **Ground Validation for actual Roof Area, and Solar Radiation: 50-60 Samples (approx.)**
- ✓ **Validation using Solar PV Generation Data: 5-10 Samples (approx.), TBD.**

##To be crossed-checked.

Using Open-Source GIS and What's new in this study?

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- ✓ **Web Application: Open Layers, Ext-JS, Geo-Ext, PHP, and Ajax;**
- ✓ **Open-Source GIS Server: Geo-Server, and Map-Server;**
- ✓ **Open Geo-Database: PostgreSQL with PostGIS;**
- ✓ **Tile-Server Caching, Cloud based, and Publicly Accessible.**

Rooftop Solar Web-GIS Tool (Beta)

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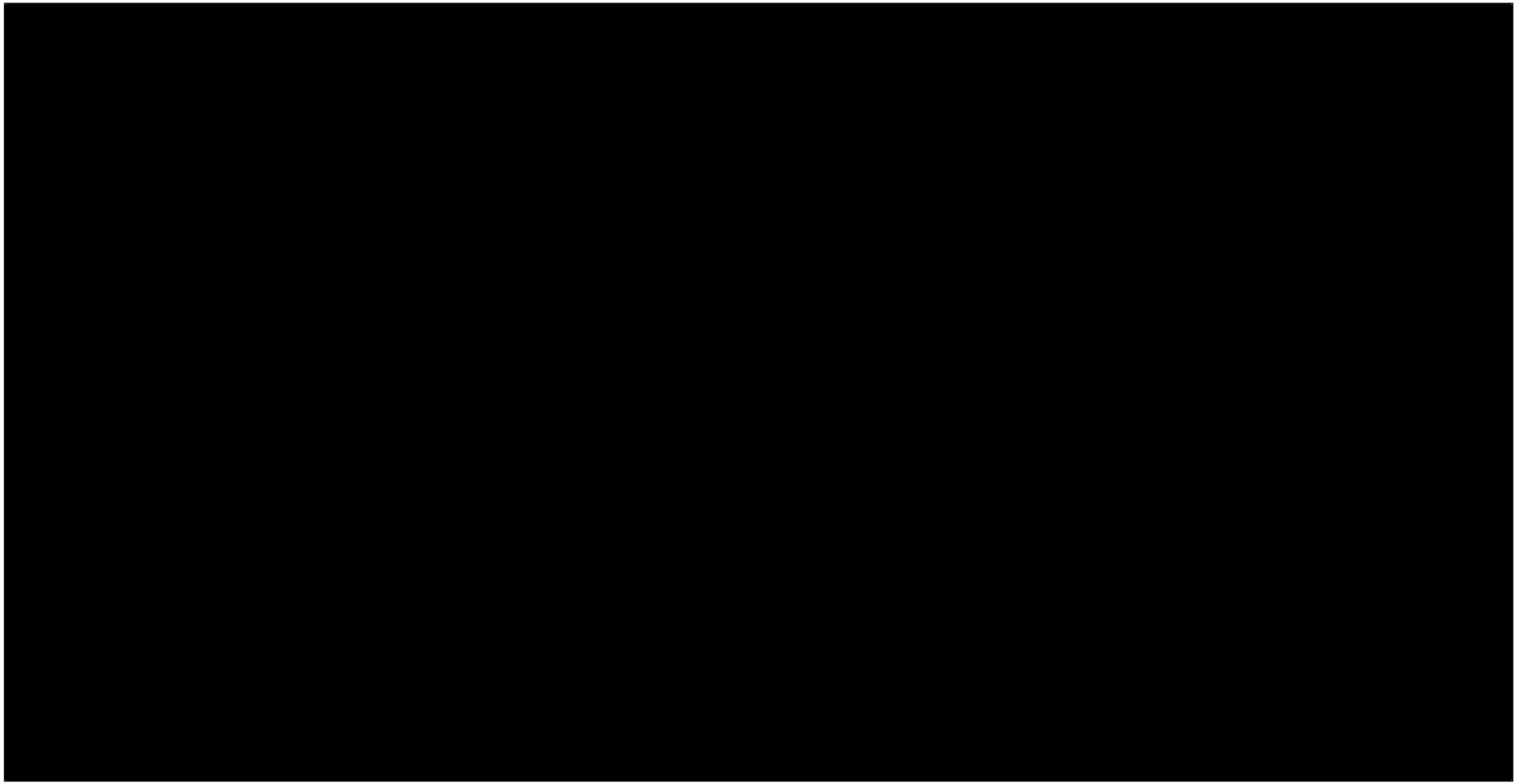

Source: http://regisindia.teriin.org/solar/Solar-WebGIS.php

Rooftop Solar Web-GIS Tool (Home Page)

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Rooftop Solar Web-GIS Tool (Base Maps)

Rooftop Solar Web-GIS Tool (Analysis Tools)

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Rooftop Solar Web-GIS Tool (Placeholder)

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Rooftop Solar Web-GIS Tool (Core Tools)

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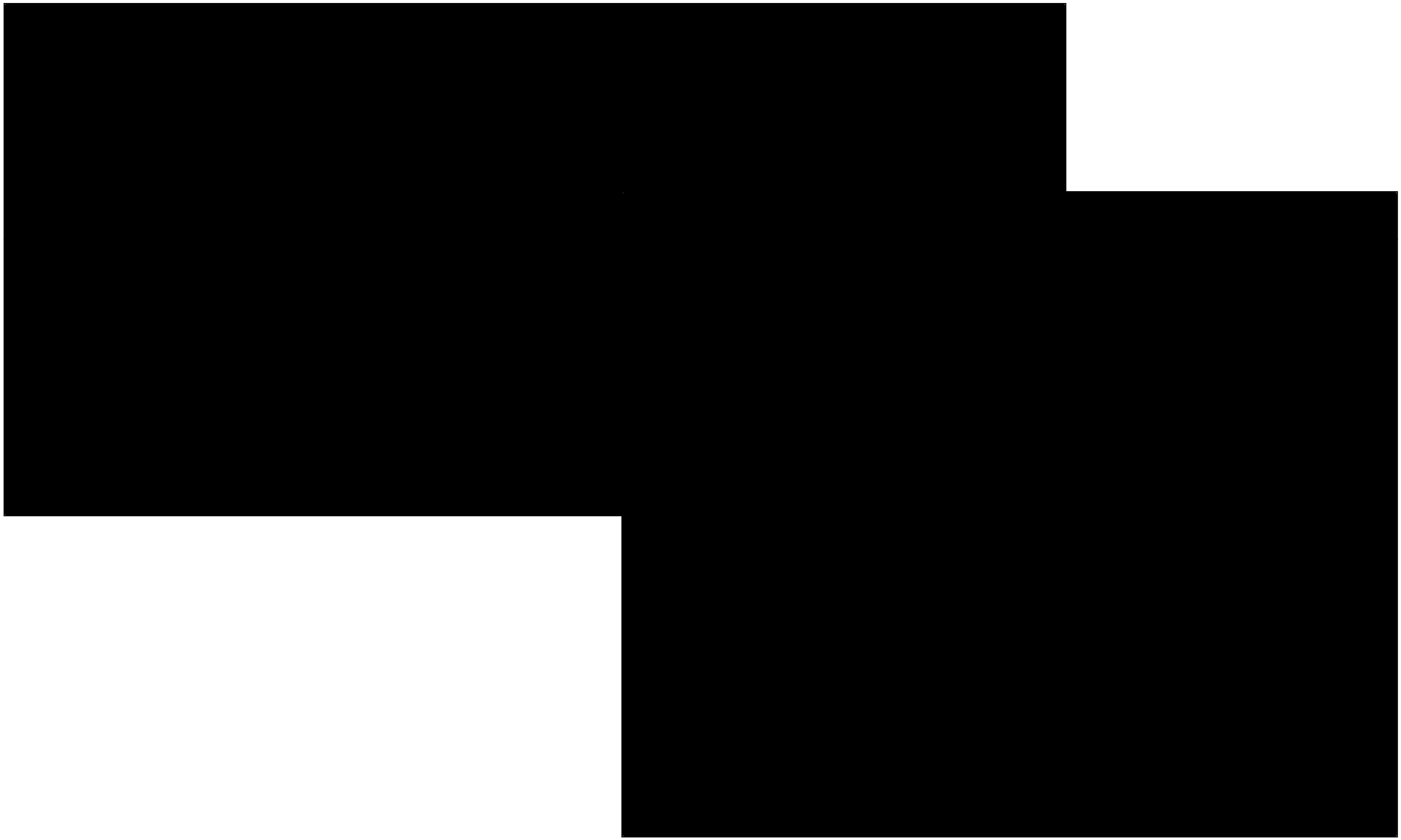

Solar Simulation Model Calculation Tool

Solar Simulation Model (Report)

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Rooftop Solar Web-GIS Tool (Spatial Editing)

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Rooftop Solar Web-GIS Tool (User Feedback)

Web-GIS based Renewable Energy Atlas for Gujarat (Ongoing Project)

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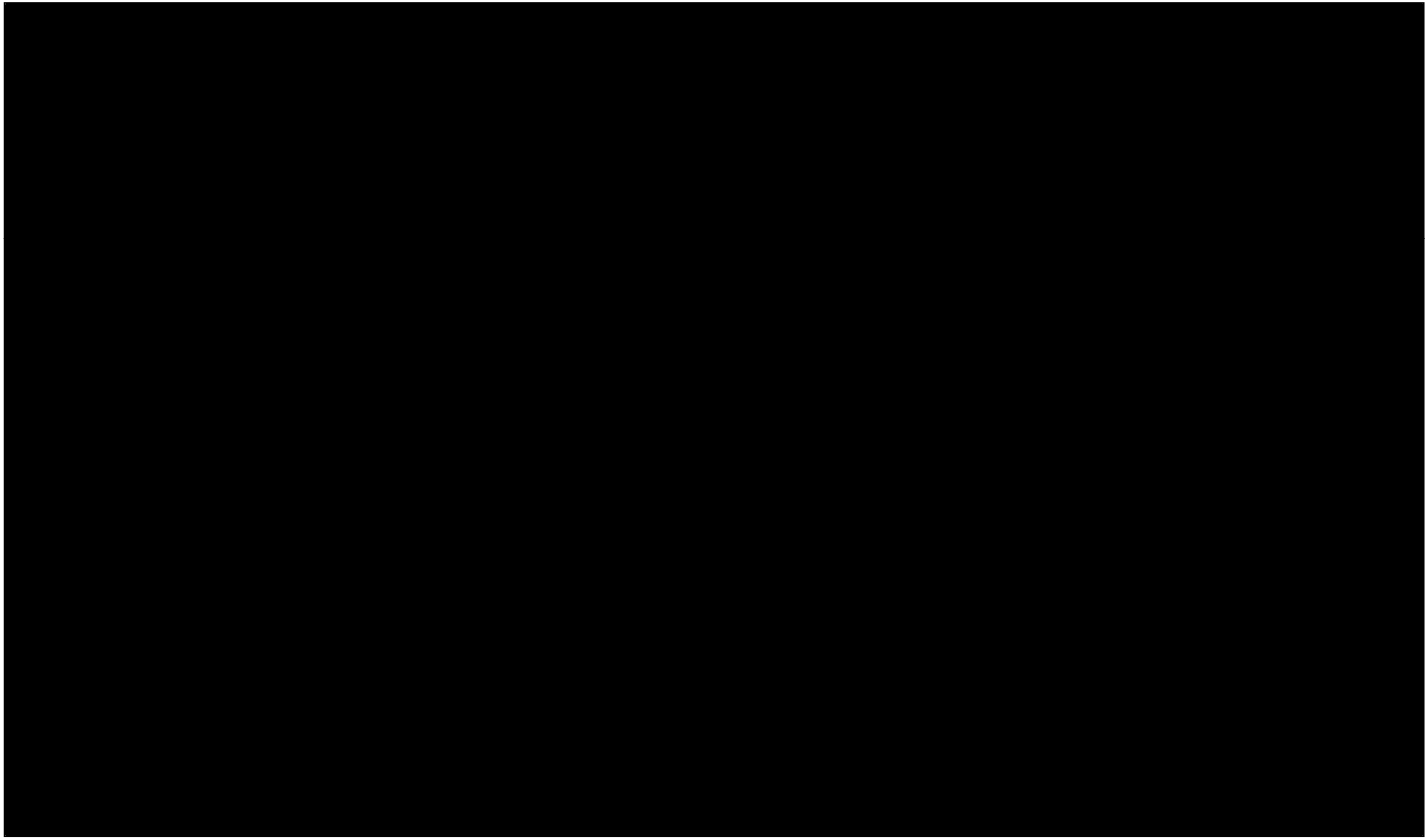

Rooftop Solar Web-GIS Tool for NCT-Delhi (Proof of Concept)

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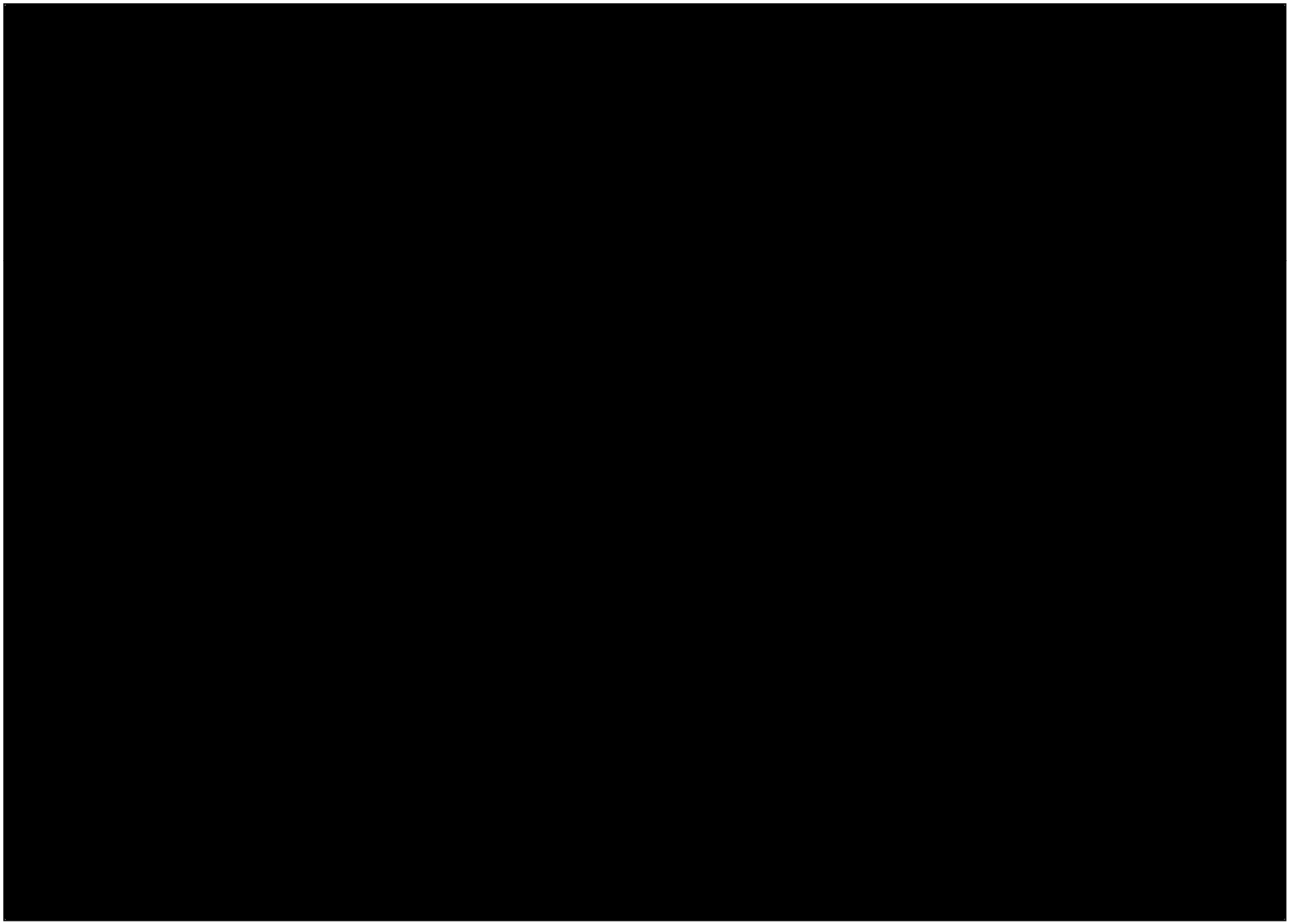

RE-GIS India (Website Highlights)

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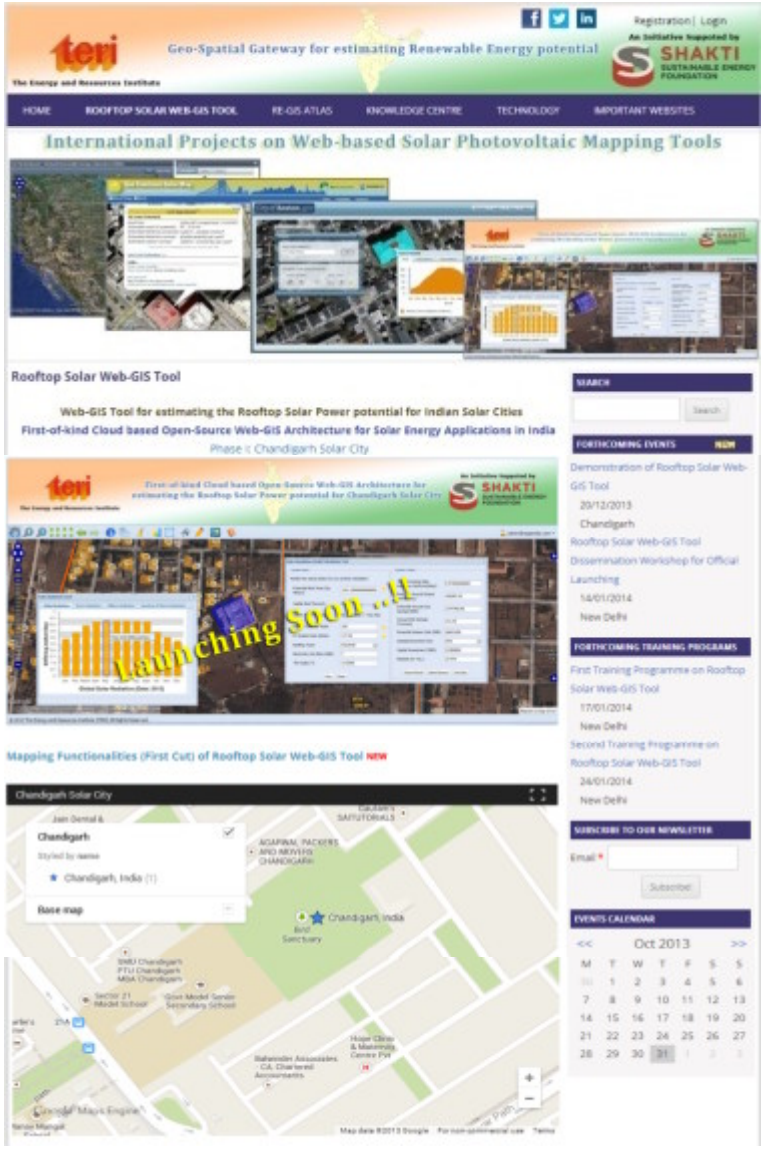
RE-GIS India (www.regisindia.com)



Outcomes from the Study

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This proposed Web-GIS tool will be an ideal medium to showcase investors the logistics of rooftop solar energy investment. The proposed tool will have following benefits:

- ✓ **It will enable user to estimate the rooftop solar power potential of selected area or, buildings for a particular location w.r.t. various SPV technologies (crystalline/thin-film);**
- ✓ **Will act as a Decision Support System (DSS) to carry out the pre-feasibility assessment of putting rooftop PV system for a particular location;**
- ✓ **Will help users to estimate potential GHG mitigation through solar rooftop PV systems for a given locality;**
- ✓ **Assess the viability of any rooftop projects based on possible business models and financial schemes available.**

Thank You

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alekhya.datta@teri.res.in

+91 11 4150 4900 (**Extn**: 2240)

Lat: 28.5899 DD N, Long: 77.2252 DD E

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