



INOVUS™

INOVUS SOLAR

A New Way for Solar

Maximizing Value with Your Solar Street Lighting System

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Inovus Solar – Lighting the World

- US Based company operating since 2007 with over 300+ solar lighting installations around the globe
- Global leader in designing, constructing, installing and operating innovative Solar Enhanced Lighting systems
- Customers include cities, utilities, military bases, retail and university entities in 10 countries
- Provide both on grid and off grid systems utilizing cutting edge design using proven technologies developed by Inovus
- Expertise in managing street lighting systems for any scale of street lighting operation

Inovus Solar – Existing Installations



Inovus Solar – USA Installations



Inovus Fusion Solar Hookup Technology

① LED Luminaire

- Latest high efficacy LEDs
- 50-250W equivalent
- No maintenance for 15+ years
- LED replacement is Optional

④ Infrastructure Reuse

- Tenon arm reused
- Pole assessed & reused
- Base assessed & reused
- Unsuitable infrastructure can be replaced & financed



② Solar Panel

- 250W solar collector
- 250W UL1741 Microinverter
- Smart controller

③ Top-Mount Bracket

- Panel tilt optimized for wind load and energy generation
- Orientation adjusted due South
- Pole-top access to power

Idaho Power & Inovus



Boise Solar Project Yields Positive Results

Project Highlights

- System exceeded annual energy generation forecast in less than 11 months
- Simultaneously replaced 288W HPS with LED that met equivalent lighting safety standards
- System could be remotely controlled and monitored and showed net-positive production (solar generated more electricity than the LEDs consumed)

Project Feedback

- Robust & Easy to install
- Safe Grid Connection
- Great Aesthetics (popular response)

Next steps with Idaho Power

- Kicked-off second project
- Working on future service offerings



Connecting On-Grid Systems to Existing Poles

Mounting

- Inverter attaches to solar panel, solar panel attaches to the pole using robust mounting brackets
- Wiring easily fed through the top
- Electrical connections made at bottom of the pole through hand hole
- Can be installed with a two man crew in less than 20 minutes
- Our national relationship with Quanta Services can be utilized to lower cost of install
- Light fixture and the solar hook up operate independently but are connected to the same power line



Why does this Approach Matter?

Innovation

- Solar panels are inexpensive but the balance of system requirements drive the cost per watt installed up
- By combining thoughtful innovation with existing light-pole real estate and grid infrastructure, Inovus makes solar energy

1. Less expensive than other approaches

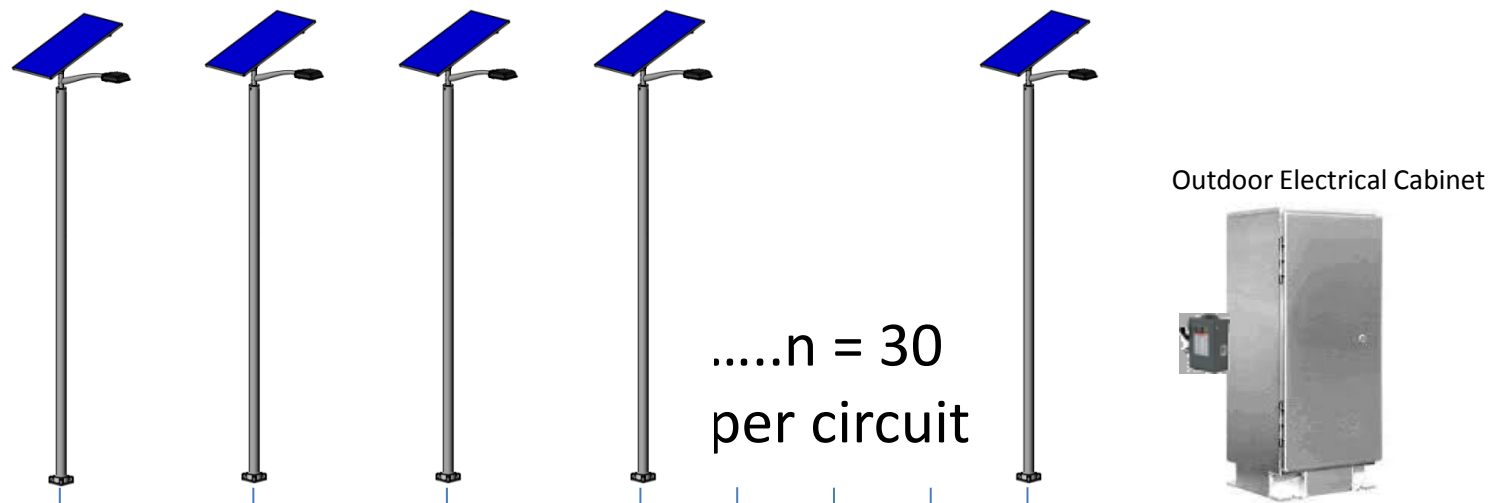
2. Easy to deploy

3. Robust

Solar-Enhanced Lighting™

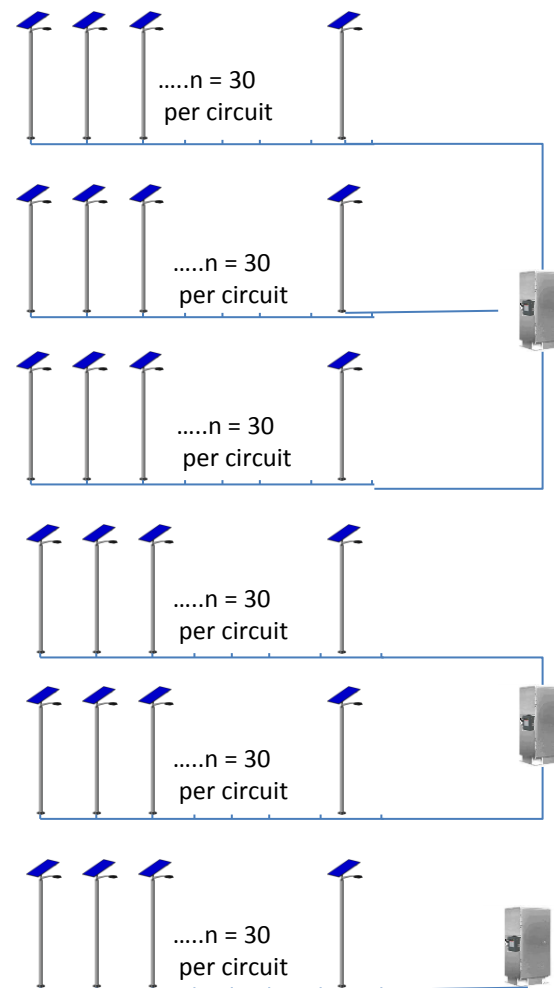
Grid Connectivity

- Approximately 30 light poles are contained in a circuit
- Existing conduit and wiring from base to electrical cabinet is re-used. No additional trenching needed
- The output from the circuit is measured through a net meter or performance meter which is typically located inside the electrical cabinet
- Each circuit is $\sim 7.5\text{kW}$ ($250\text{ W/panel} * 30$)



Solar-Enhanced Lighting™ Scaling System

- Multiple circuits are aggregated to create the desired size of project
- Each Meter can have multiple circuits or just one circuit
- All circuits owned by a single entity may use aggregated metering
- Example: City that owns 20,000 lights may create a 5 megawatt distributed solar project



Solutions that the Inovus Approach Enables Programs

1. **Community Solar:** implement for less money and hassle

2. **Energy Services:** generate for less money and hassle

3. **Street Lighting Services:** lower your cost of street lighting services now and maintain low rates into the future

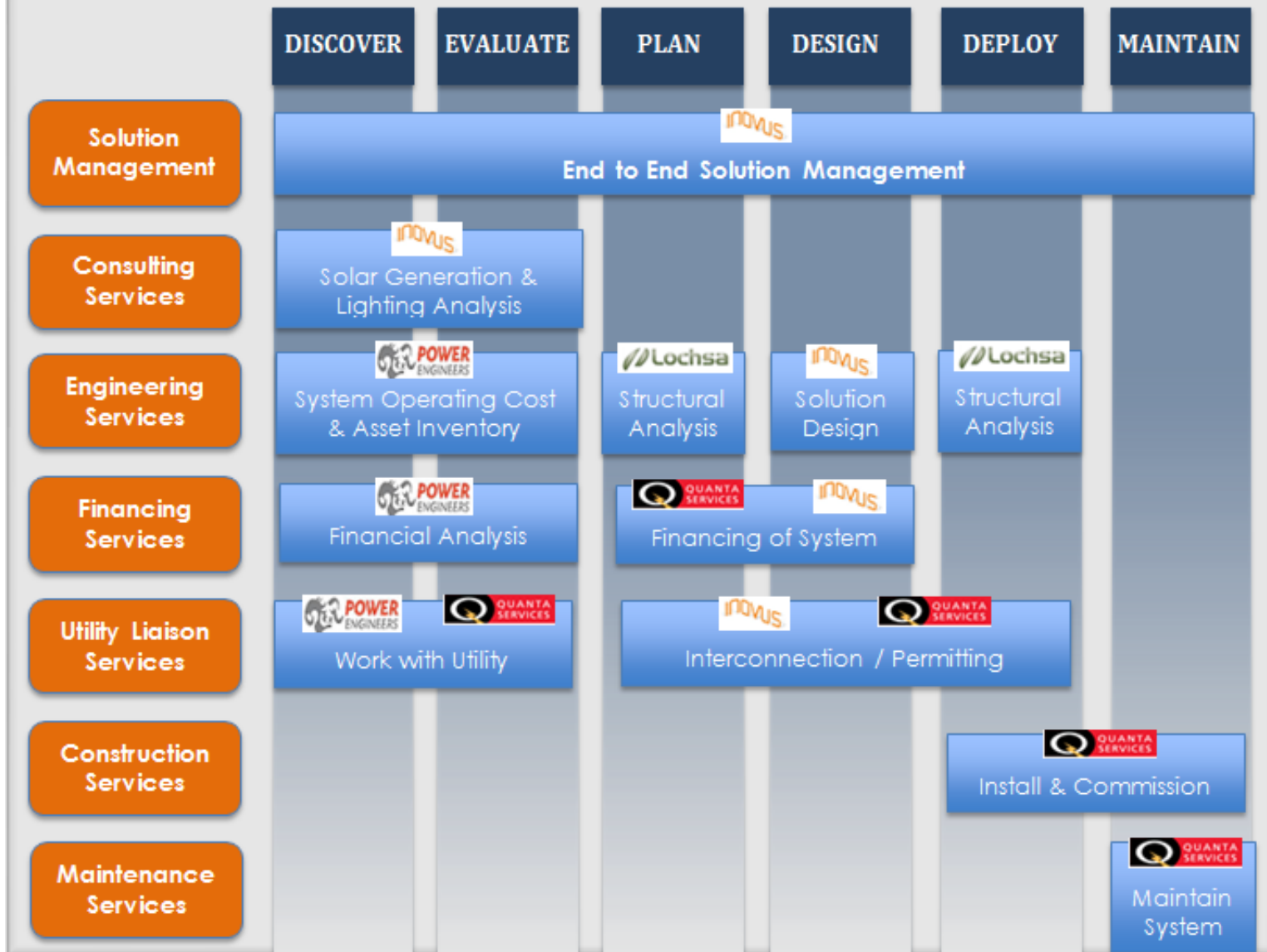
*Improve a city's sustainable status and help reduce carbon emissions

Inovus' Unique Approach is Simplifying Solar

We Eliminate Solar Barriers

- Inovus has streamlined the solar process by bringing all facets of implementing solar into one simple model.
 - Energy production forecasts
 - Inventory of Assets
 - Lighting Design
 - Structural Assessments
 - Varied Financing Options
 - Utility Process Coordination
 - Engineering
 - Installation
 - Long term maintenance
- Inovus and our partners take the complexity out and remove the execution risk from your plate

INOVUS SOLAR SOLUTION APPROACH: Solar-Enhanced Lighting™



Developing a Pilot Project

The Process

- Project Identification:
 - Visual inspection of existing poles and foundations
 - Meeting with public works to review:
 - Structural analysis of pole attachment
 - Engineering certification process (Lochsa Engineering)
 - Meet with Utility to review grid connection
 - Pilot Identification. Find a high profile street section(s) for project
 - Identify permits and fees for project
 - Analysis of location for wind load, shading, generation
- Proposal for pilot (Total elapsed time 30 Days)
 - Includes steps, price, and estimated energy generation

Getting Started

- Ensure customer and their constituents understand financial, environmental and political benefits in developing an Enhanced Solar Lighting Pilot project with Inovus
- Identify internal solar lighting “champion” that can work with Inovus to develop a Solar Lighting Pilot proposal
- Develop a solicitation that can help reduce unnecessary expenses for managing street lighting systems while creating a clean energy system that can actually generate income for budget stretched communities on existing infrastructure
- Get started today! Contact:
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