Solar-Power for Africa

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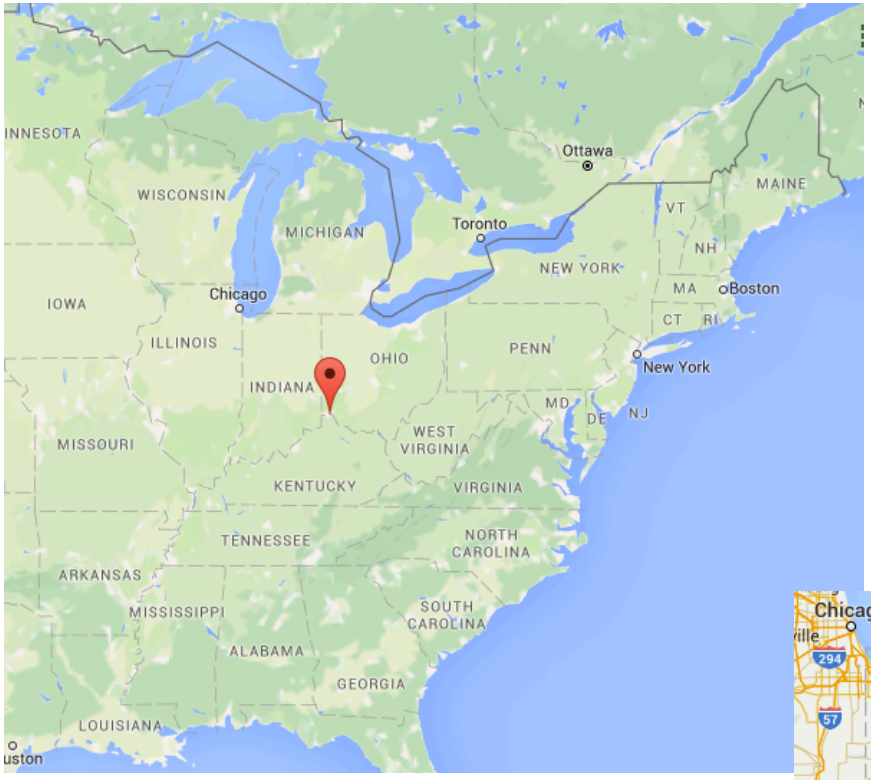
University of Cincinnati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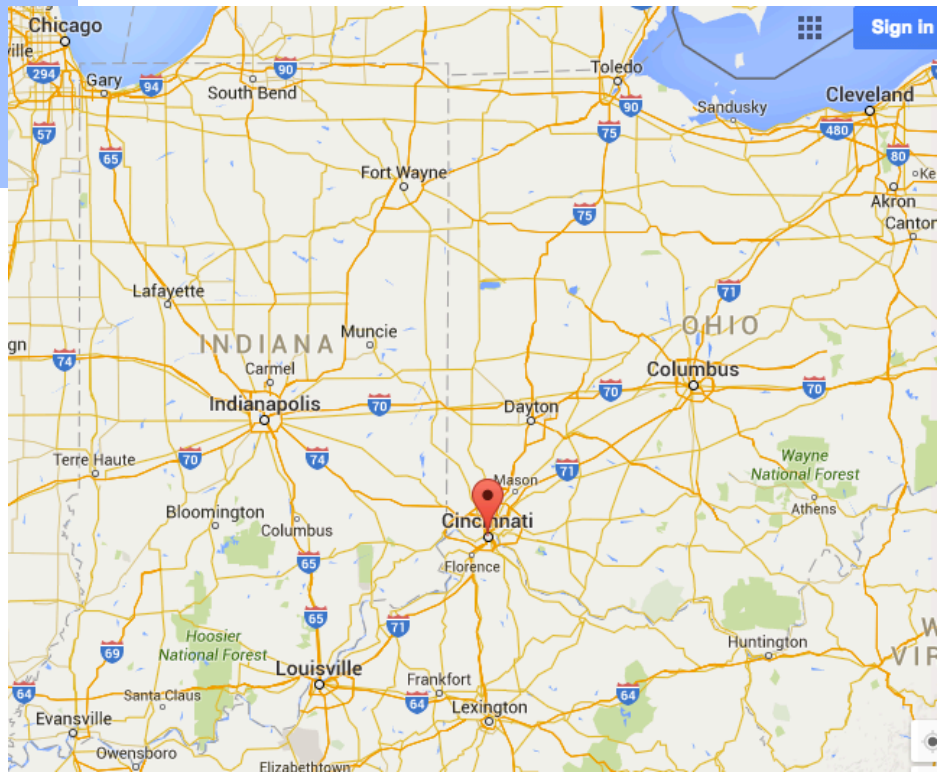
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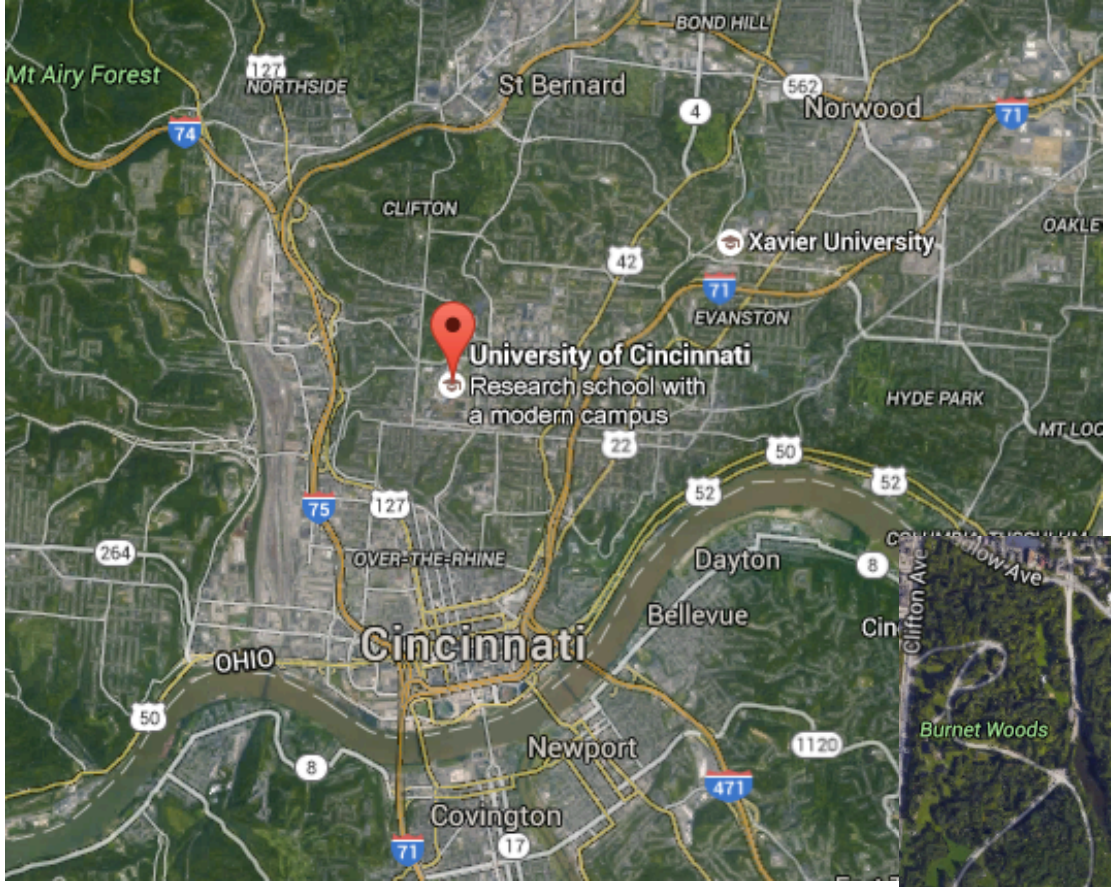
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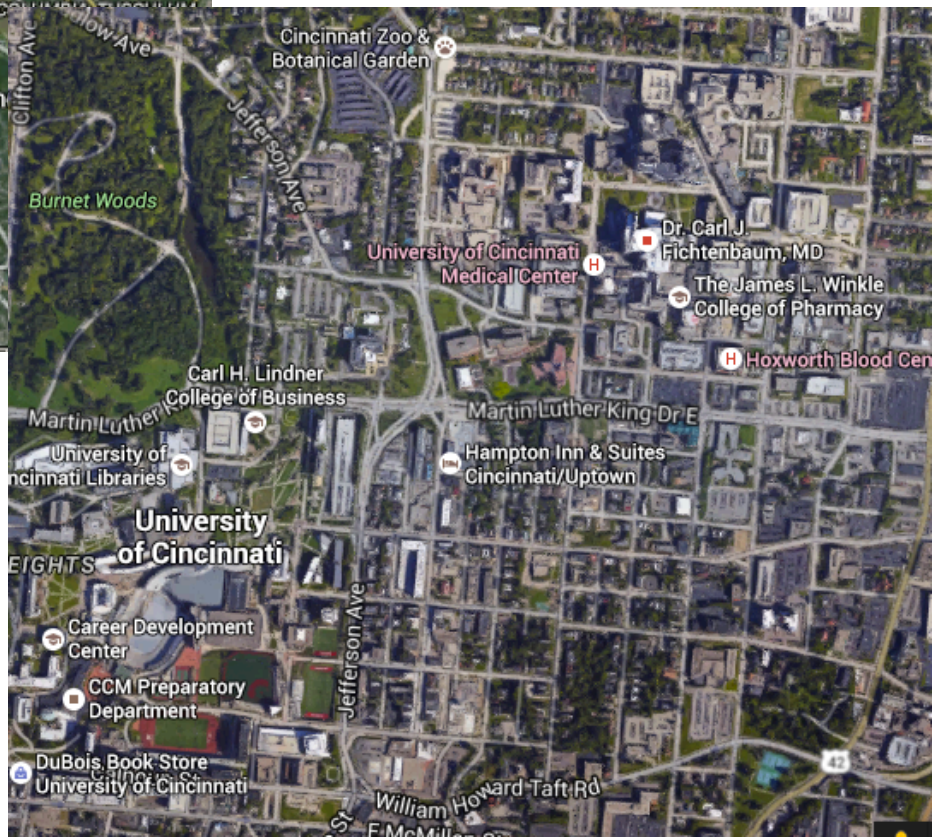
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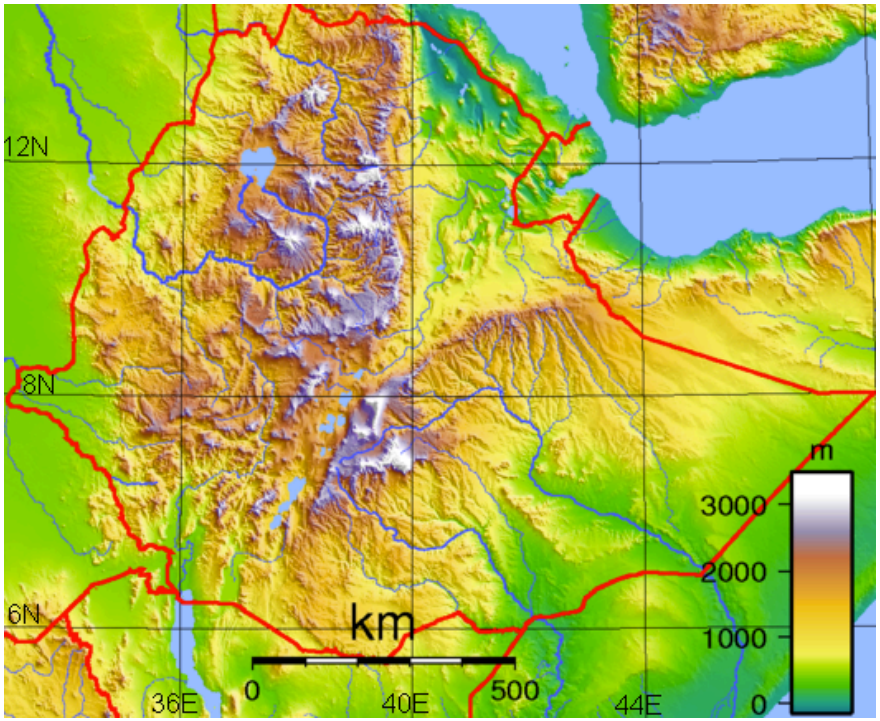
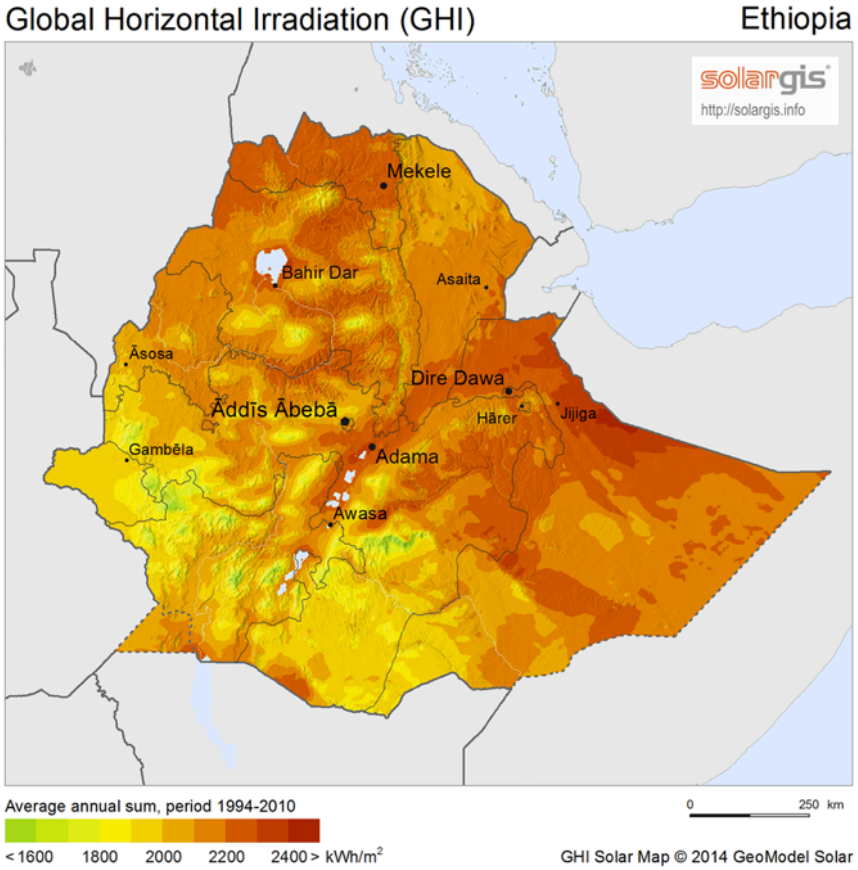


Solar irradiance is the highest on Earth

Typical value in Ohio is ~1200 kWh/m^2



Ethiopia is at high altitude and close to the equator (bottom edge of map).

Population about 100 million people.

Mostly rural farmers.

Accomplishments & Impacts

- Forge relationships between the University of Cincinnati and Ethiopian undergraduate students

- Entrepreneurial approach to development assistance as a partnership

- Application of engineering, design, and business training towards a collaborative project that can improve the living standard for rural sub-Saharan communities


HARAMAYA UNIVERSITY


Ulitium
1 Light Kit


Well # 1
10 m, dry

Well # 2

30 m, almost dry


0910971346
2000LTS
PRADO
14848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College Student Interaction and Community Outreach:

Outdoor lighting for safety improvement in a rural Ethiopian village.

-Engineering, Architecture, Design, and Marketing undergraduate students from the University of Cincinnati (UC) will collaborate with their counterparts at Dire Dawa University (DDU) to assemble outdoor solar lighting from components as a learning experience for in country manufacture of solar lighting.

-The project will be conducted in December, during a visit by 14 UC students to Dire Dawa.

-A target village, in the Oromo Mountains, will be fitted with 35 outdoor lights that will improve safety and living standards in an area with no grid power

-Students will assess the impact and viability of a business model for the student designs.

-The interaction is expected to lead to long-term relationships between the US and Ethiopian students as well as between the two groups of students and the village.

College Student Interaction and Community Outreach:

Outdoor lighting for safety improvement in a rural Ethiopian village.

-Safety at night can be enhanced by lighting, especially in rural villages

-Low cost solar lighting is simple to manufacture in Ethiopia

-Demonstration of manufacturing at Dire Dawa University

-Demonstration of usefulness of solar lighting at small village near Haramaya

College Student Interaction and Community Outreach:

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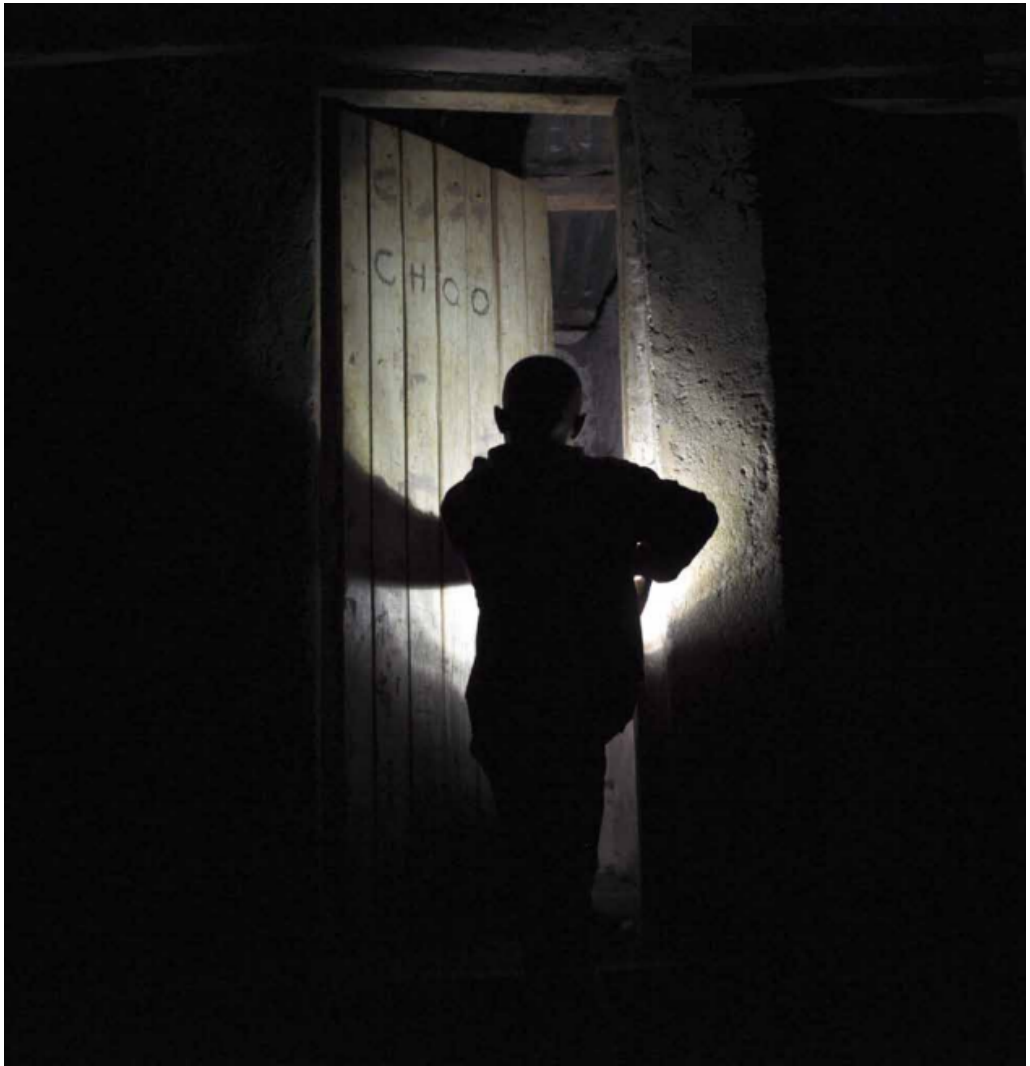

College Student Interaction and Community Outreach:

Outdoor lighting for safety improvement in a rural Ethiopian village.

Figure 3. Alfredo Moser and his solar light invention in Brazil. (www.bbc.com/news/magazine-23536914)

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Figure 1. Solar lanterns in use in the Philippines (www.youtube.com/watch?v=0PSsyufpZ2Q).

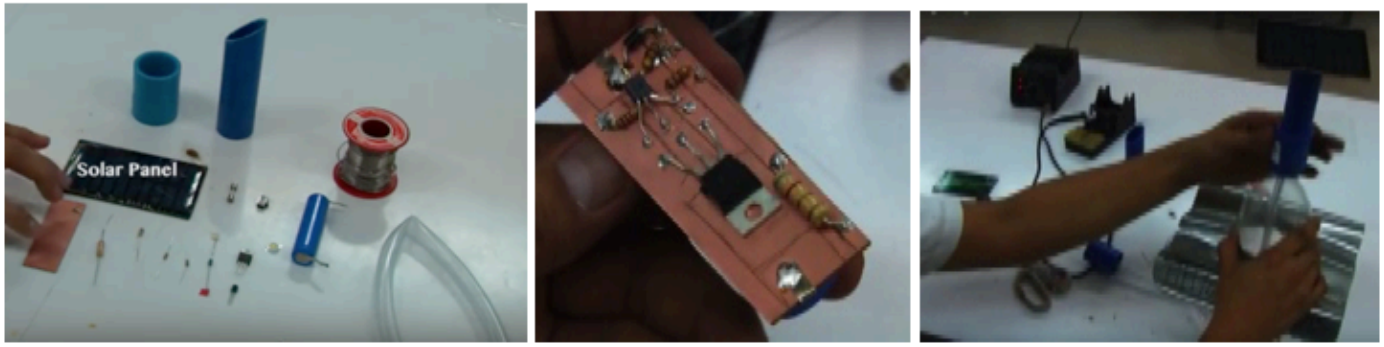

Figure 2. Assembly of a solar lantern using simple components available in country. (www.youtube.com/watch?v=bAPNtEFzrcA)

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Number of People Impacted by Project:

Ethiopians:

Primary School Students: 600-650
Primary School Instructors: 4
Villagers: 100
Regional impact of demonstration
of simple solar technology ~many 10,000s
College students at Dire Dawa University participating 30 actively involved total impact 300
Faculty at Dire Dawa University, 50
Haramaya University, 4
Addis Ababa University 10

US:

Undergraduate students: 16-18 traveling, 4-6 not traveling
Faculty: 2 traveling, 1 not traveling

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Outdoor lighting for safety improvement in a rural Ethiopian village.

Estimated Budget for Materials:

In country purchases:			
80 Bags of Concrete	$3 per bag	$240	
~2 Bags per pole			
40 PVC Pipes 4' x 10"	$20	$800	
30 PVC T & U joints	$10	$400	
Solder		$50	
Subtotal for Installation:		$1490	Per unit cost ~$37
Purchases in US:			
40 Blank PCBs		$25 (Amazon.com)	
40 LED Bulbs		$15 (Ebay.com)	
40 Solar Panels		$130 (Alibaba.com)	
40 Batteries		$250 (BatterySpace.com)	
Wire etc.		$100 (TBD)	
Subtotal for Lanterns:		$520	Per unit cost ~$13
Grand Total:		$2,010	Per unit cost ~$50


End