LEBANESE REPUBLIC
MINISTRY OF ENERGY AND WATER

LCEC
LEBANESE CENTER FOR ENERGY CONSERVATION
المركـز اللبنـاني لحفـظ الطـاقـة
*efficient resources, sustainable achievements*

# The Evolvement of the Solar Water Heaters Market in Lebanon

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IBEF
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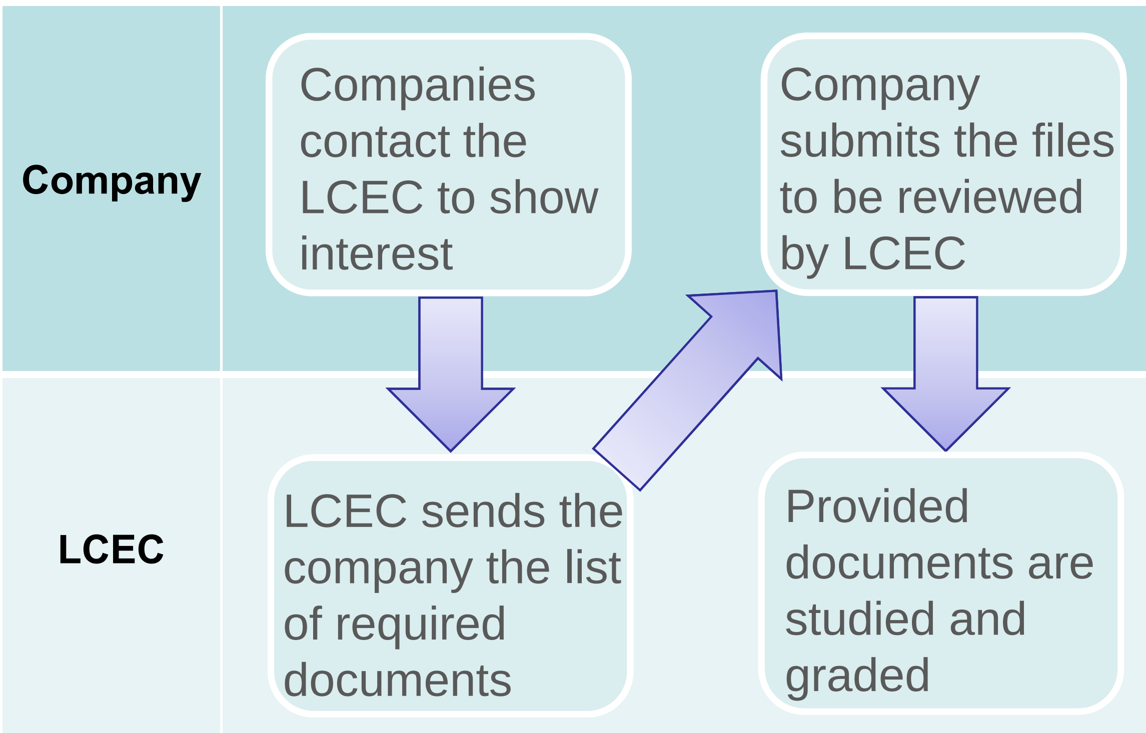
# Qualification Process




LCEC publishes the list of qualified solar water heater companies on a quarterly basis

Version 17 of the Qualified Solar Water Heater Companies contains 54 registered companies and more than 270 components

# Grading System

The company and its products are assessed based on a grading system that has a maximum of 1200 points out of which 905 are related to company features and 295 to its product features

| Company's Grade | Star rating |
|---|---|
| < 400 | 0 Stars |
| 400 → 500 | ☆ |
| 500 → 600 | ☆☆ |
| > 600 | ☆☆☆ |

| Product's Grade | Star rating |
|---|---|
| < 150 | 0 Stars |
| 150 → 200 | ☆ |
| 200 → 250 | ☆☆ |
| > 250 | ☆☆☆ |

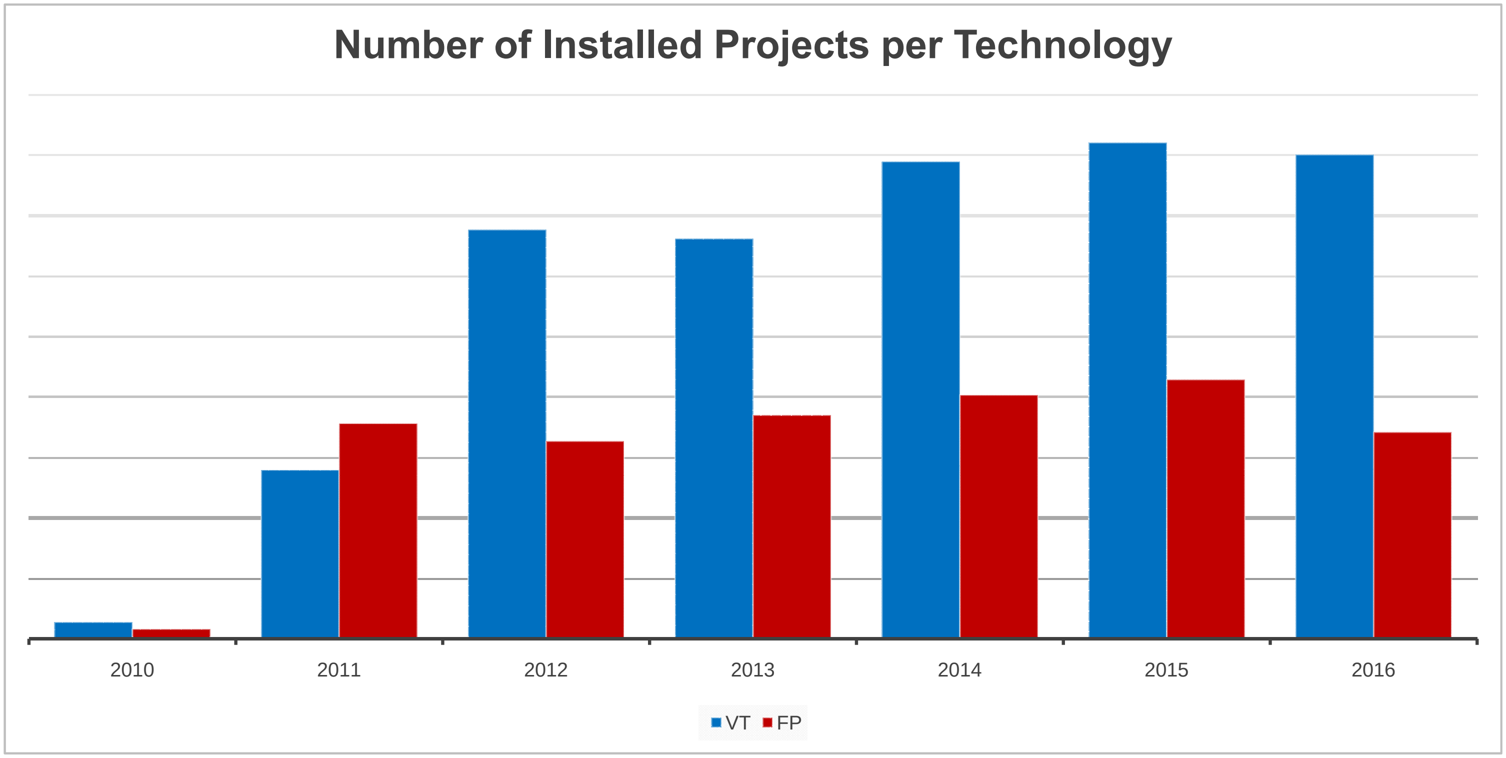
# Environmental Analysis

- Solar Water Heaters have offset the emission of 236.68 Ktons of $CO_2$ on an annual basis and offset the need for production of 364.14 GWh of electricity, the equivalent of a 60 MW plant

| | Energy Equivalent (KWh/year) | $CO_2$ Emissions Reduction (Ktons) |
|---|---|---|
| Subsidized Systems | 13,397,065 | 8.71 |
| 0% Interest Loan | 21,854,056 | 14.2 |
| Systems Installed by Qualified Companies | 79,173,050 | 51.46 |
| Lebanese Market Since 2010 | 160,258,181 | 104.17 |
| Overall Lebanese Market | 364,137,943 | 236.68 |

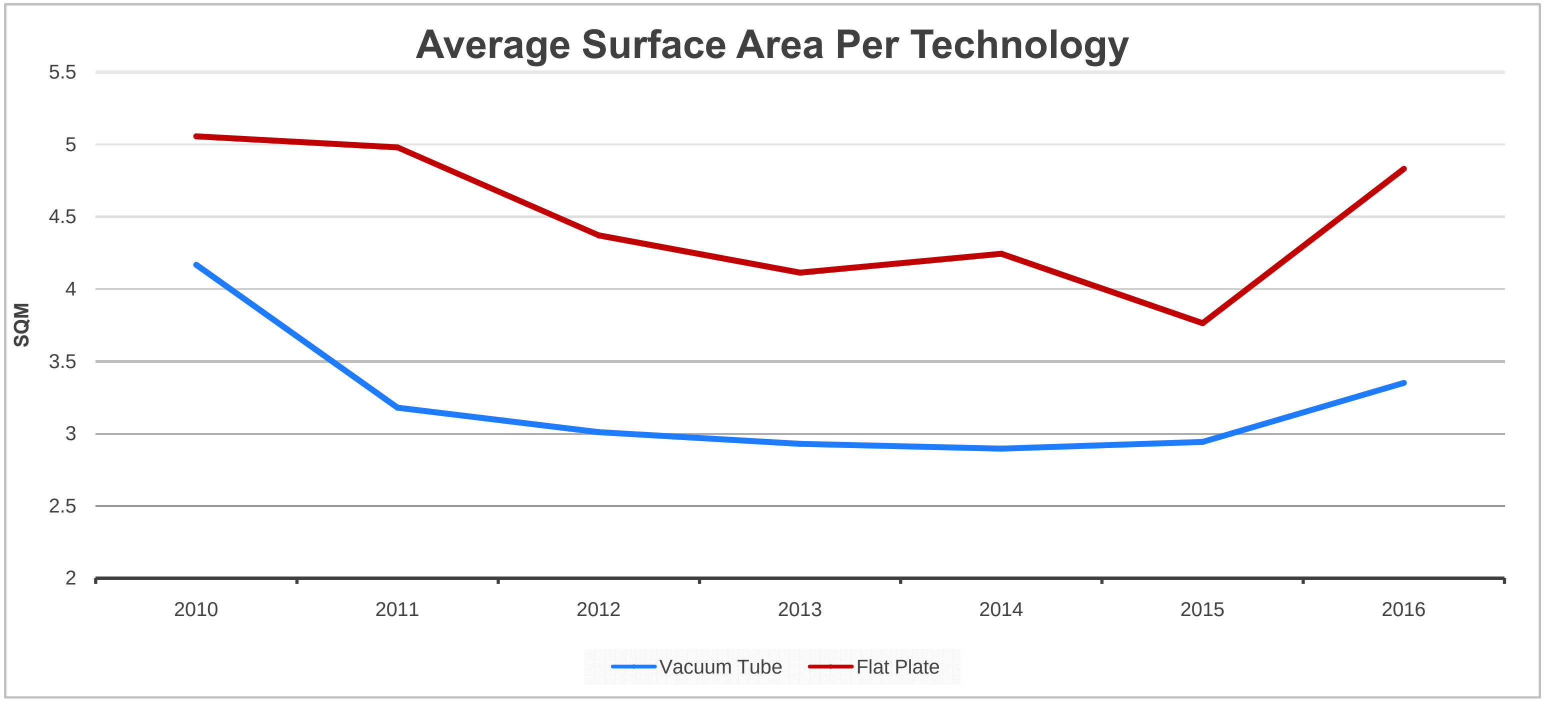
# Technology Deployment Throughout The Years

Vacuum tube projects dominate the Lebanese market with almost double the number of projects than flat plate collectors



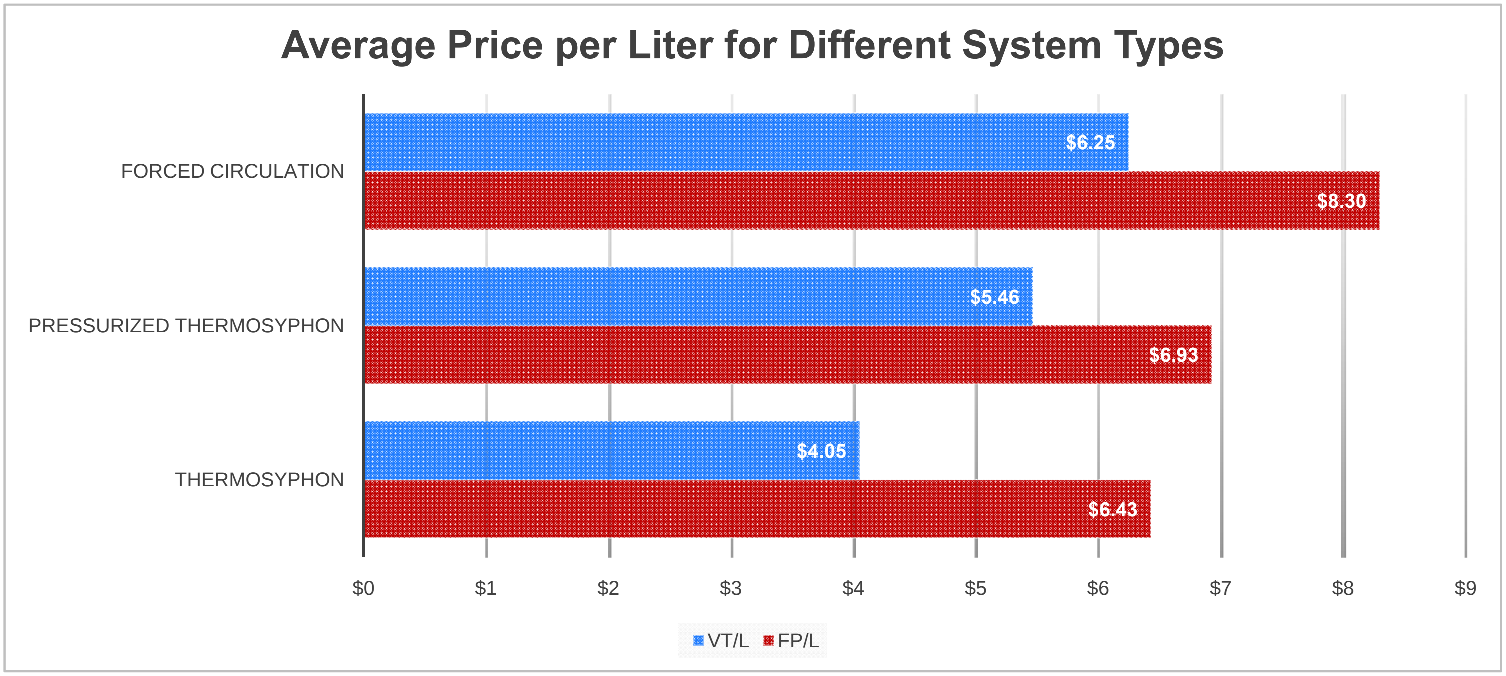
# Technology Deployment Throughout The Years

- Flat Plate solar water heaters have a higher average of installed surface area than vacuum tube heaters with a lower capacity



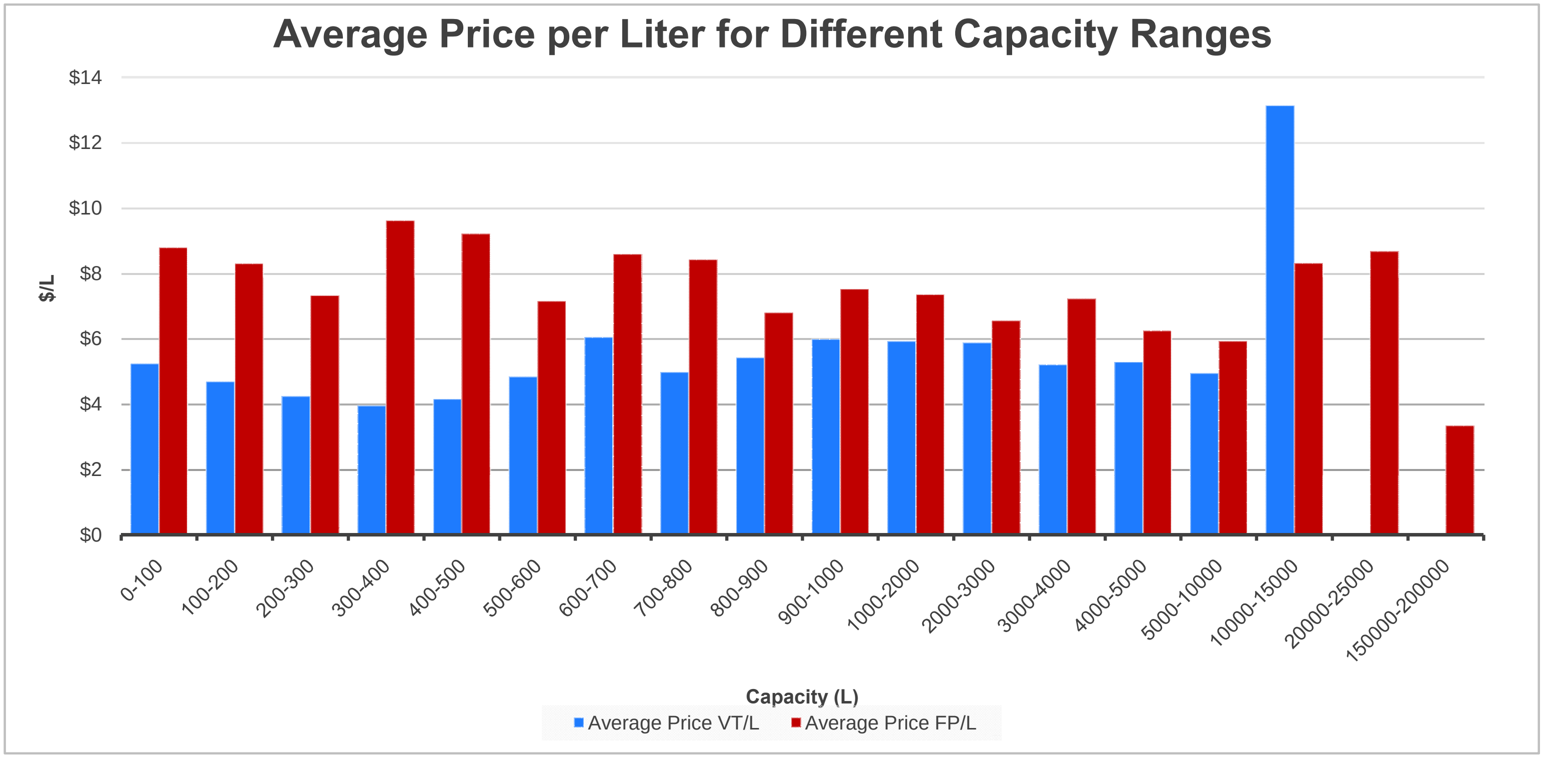
# Average Price per System Type and Technology

Forced Circulation is the most expensive system type, followed by pressurized thermosiphon, leaving the thermosiphon systems as the cheapest systems



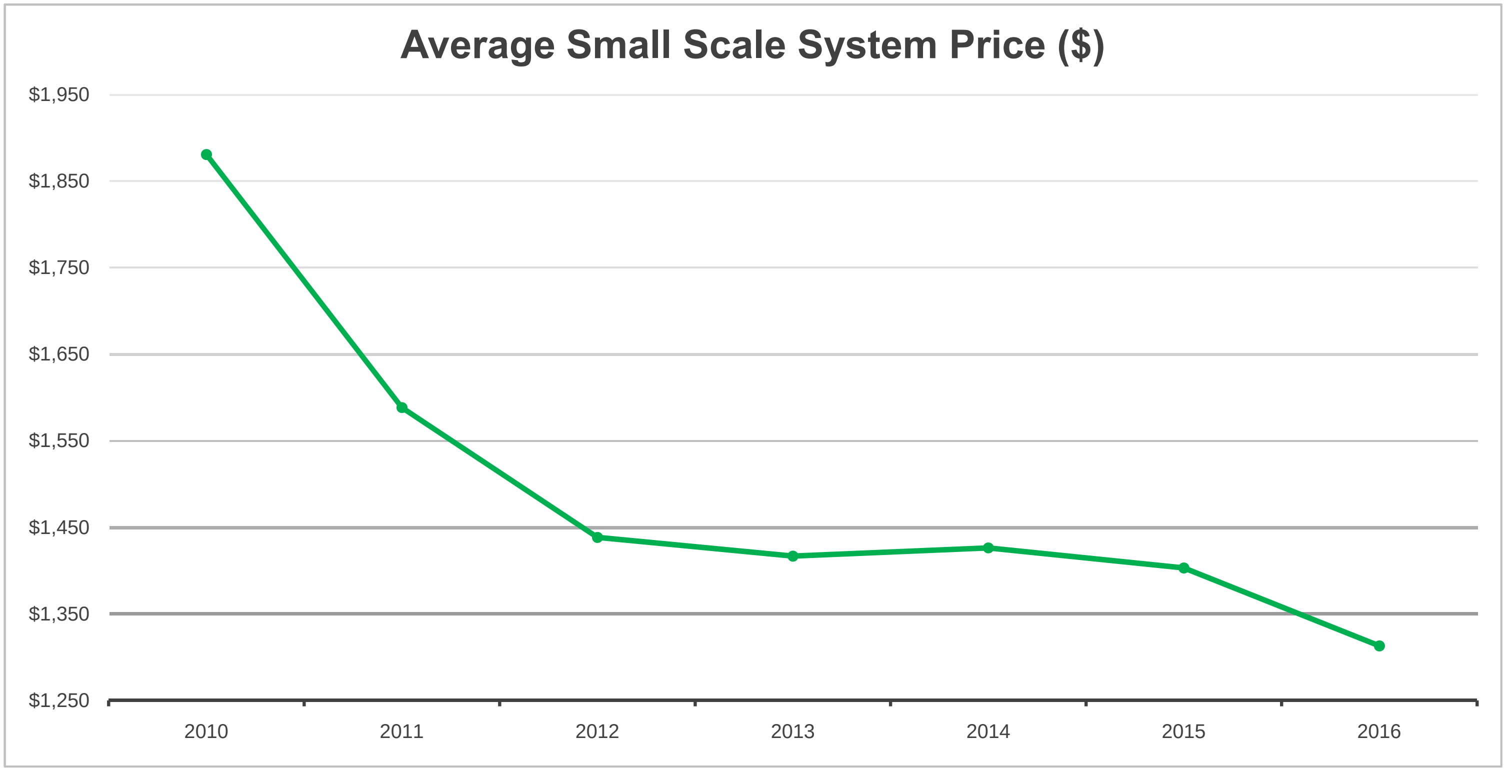
# Average Price of Technology

The price gap between vacuum tube and flat plate technologies decrease with the increase of the project's size



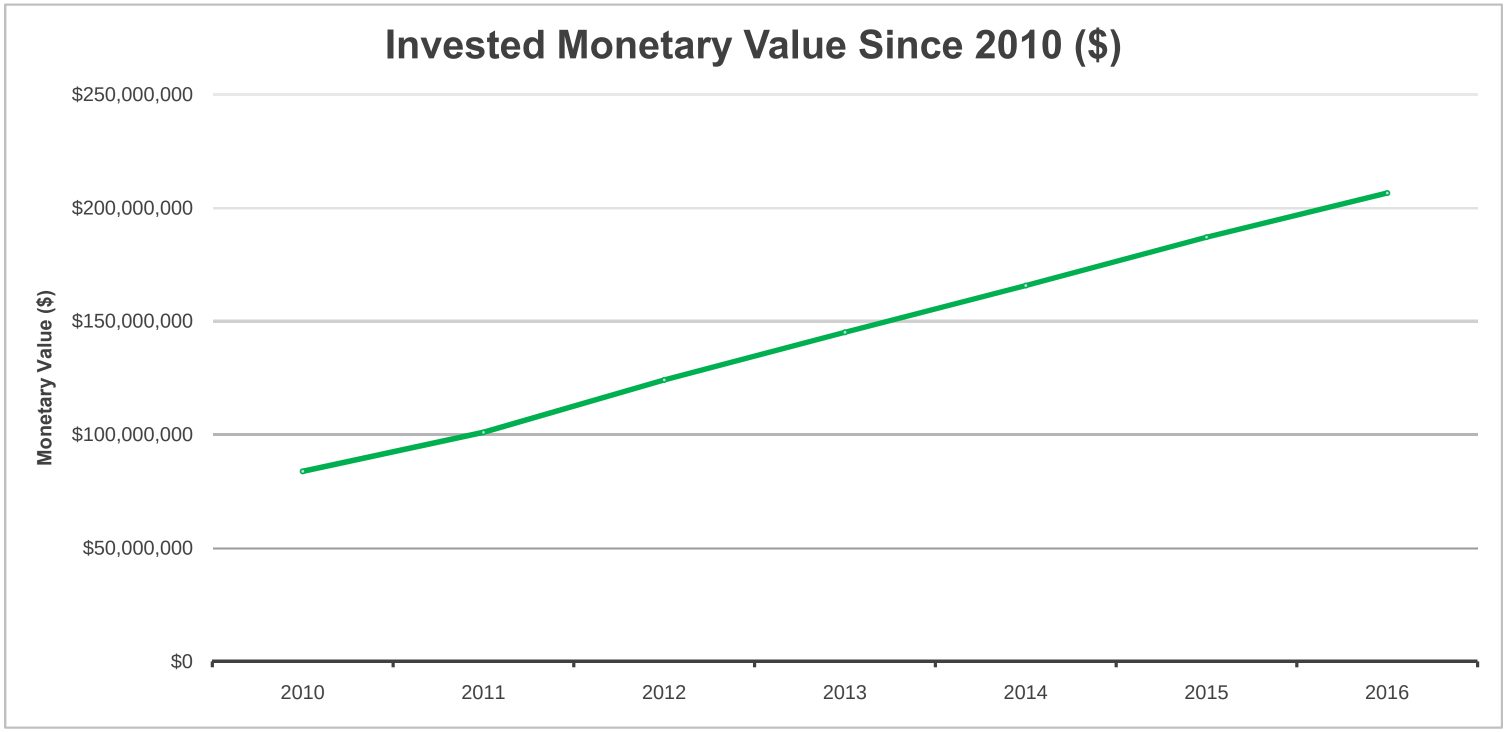
# Average Price per System

The overall average price of a solar water heating system has dropped significantly since 2010



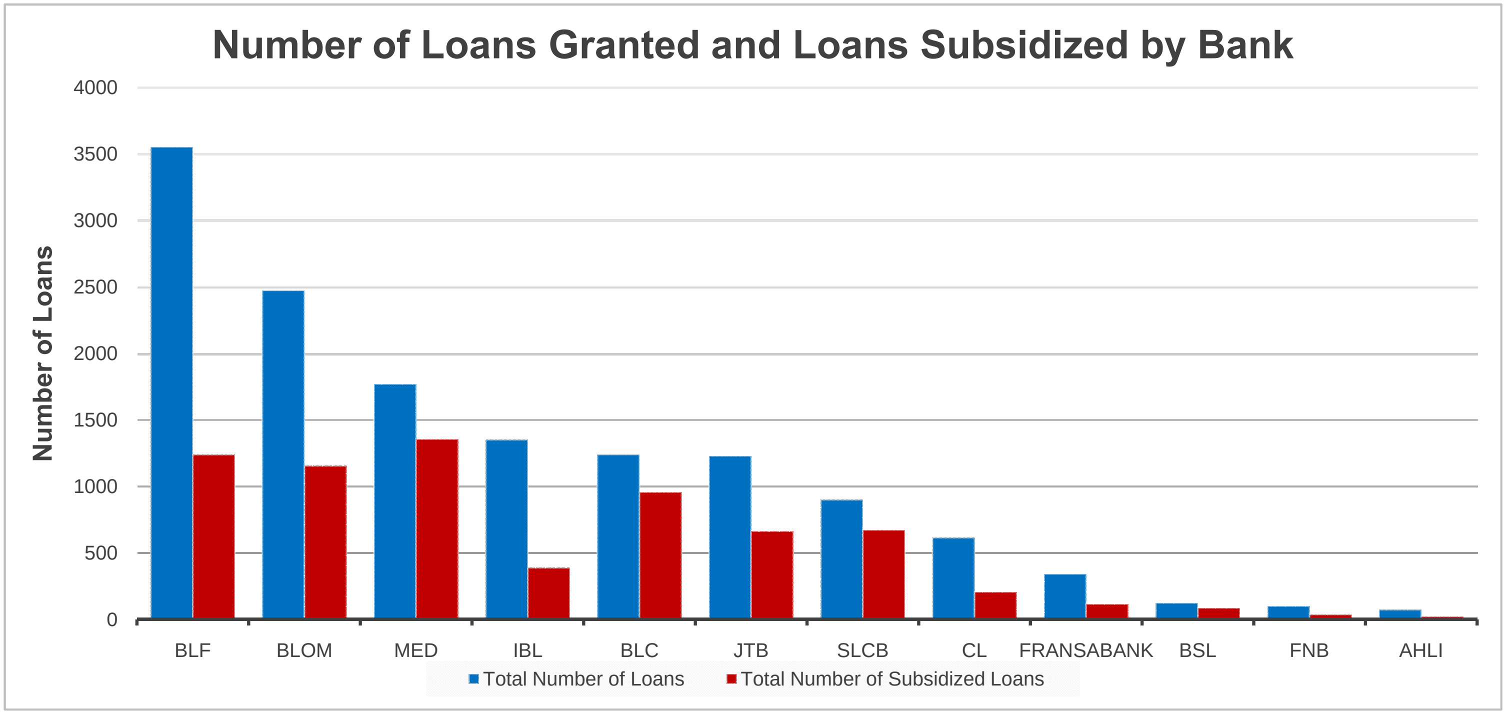
# Cumulative Installations Since 2010

Since the Start of the Program in October 2010 and until December 2016, companies have installed almost 315,000 SQM, more than 21,000,000 L and mobilized a capital exceeding $120,000,000



# Bank Operations

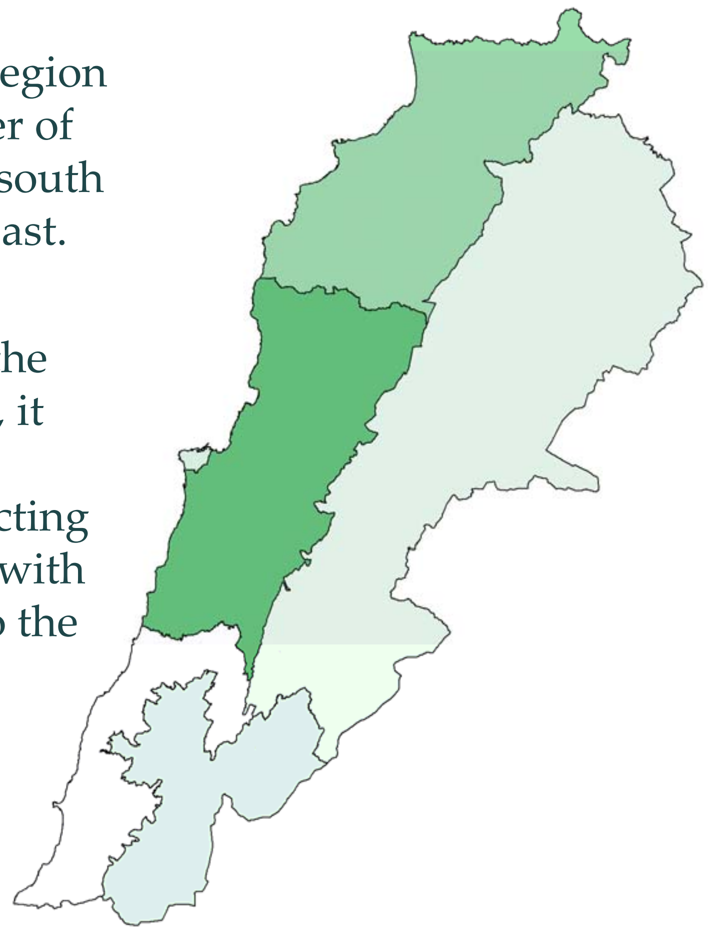
15% of the projects seek a loan from the bank. 10 Banks are currently cooperating with LCEC. Banks that have a high ratio of subsidized loans against granted loans consider the list of qualified solar water heater companies as a guarantee for the client's product.



# Geographic Distribution

- Mount Lebanon is the region with the highest number of installations, while the south is the region with the least.

- While Beirut is fifth in the number of installations, it moves to third place in installed capacity, reflecting a tendency for projects with higher capacities due to the lack of space

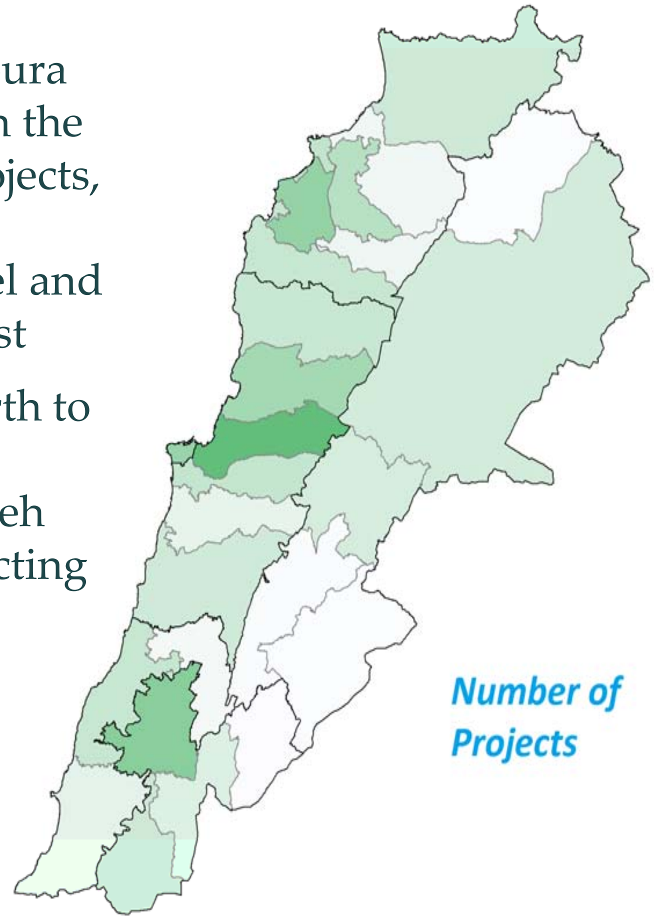


*Capacity*

| Governorate | Percentage |
|---|---|
| Mount Lebanon | 36.7 |
| North | 25.0 |
| Beirut | 12.2 |
| Nabatieh | 11.5 |
| Bekaa | 10.1 |
| South | 4.4 |

# Geographic Distribution

- Metn, Nabatieh and Koura rank as top 3 districts in the number of installed projects, while Jezzine, Western Bekaa, Rashaya, Hermel and Hasbaya rank the lowest
- Beirut moves from fourth to second place in district capacities while Nabatieh falls to fifth place, reflecting the need for smaller systems than Beirut




| District | Percentage |
|---|---|
| Metn | 12.2 |
| Nabatieh | 9.2 |
| Koura | 8.3 |
| Beirut | 7.9 |
| Kesrouan | 7.0 |
| Zgharta | 5.5 |
| Tripoli | 4.7 |
| Baabda | 4.5 |
| Saida | 4.3 |
| Batroun | 4.2 |
| Jbeil | 4.1 |
| Bint Jbeil | 3.8 |
| Akkar | 3.8 |
| Chouf | 3.6 |
| Baalbek | 3.4 |
| Zahle | 3.1 |
| Marjeyoun | 2.6 |
| Tyr | 2.1 |
| Aley | 1.8 |
| Bcharre | 1.3 |
| Miniyeh-Danniyeh | 1.1 |
| Jezzine | 0.7 |
| Western Bekaa | 0.3 |
| Rashaya | 0.2 |
| Hermel | 0.2 |
| Hasbaya | 0.1 |

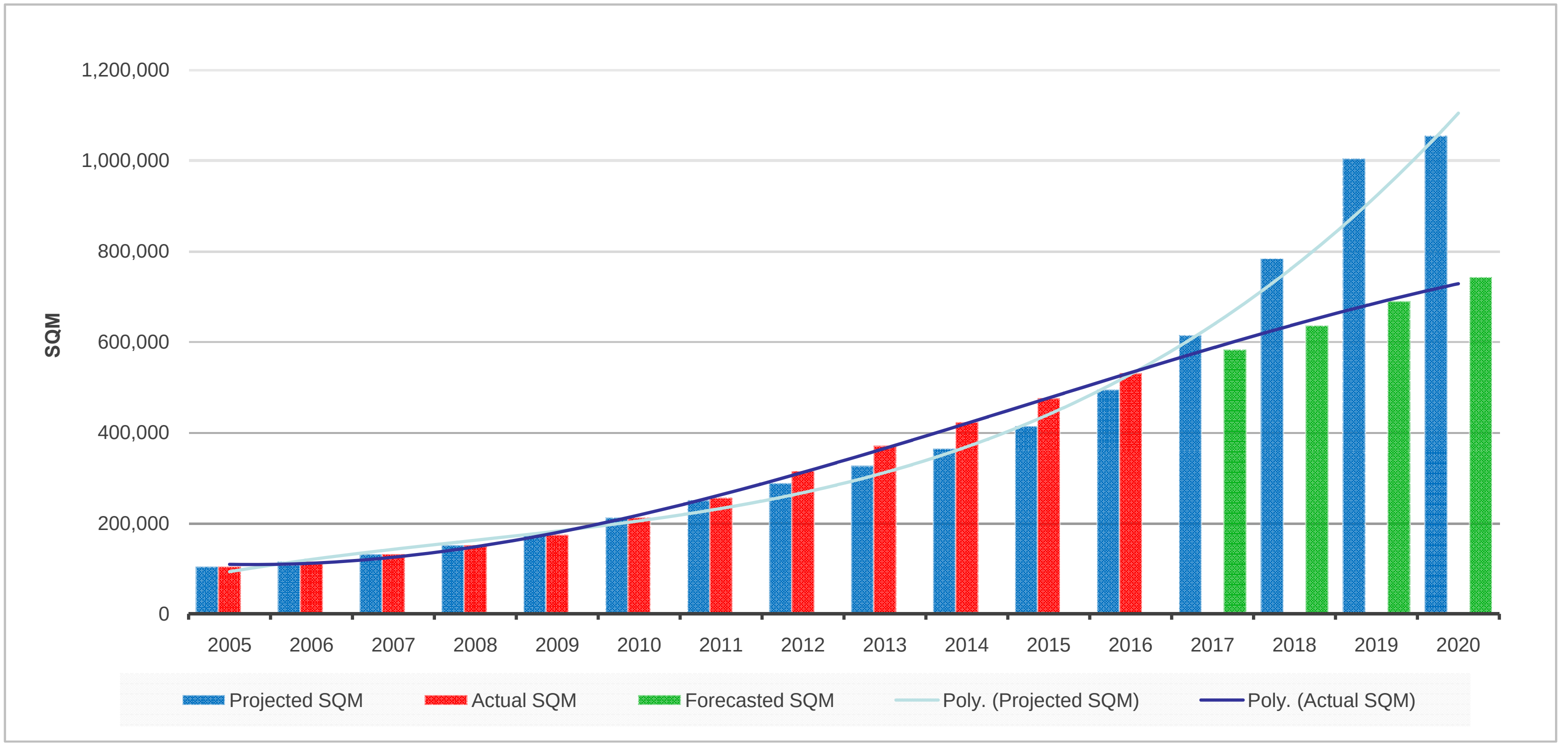
# Geographic Distribution

- If we compare the number of In[illegible]lled systems to the number of buildings/apartments that can [illegible]pplied with solar water heaters, it shows that the market is fa[illegible]ing saturated


| Governorate | Total P[illegible] Clien[illegible] | [illegible]lled [illegible] | Penetration |
|---|---|---|---|
| Nabatieh | 85 [illegible] | [illegible] | 16.03 % |
| North | [illegible] | [illegible] | 12.54 % |
| Mount [illegible]anon | [illegible] | [illegible] | 7.54 % |
| Bekaa | [illegible] | [illegible] | 6.95 % |
| Beirut | [illegible] | [illegible] | [illegible].39 % |
| South | [illegible] | [illegible] | [illegible].57 % |
| Total | 1,051,694 | 89,479 | 8.5 % |

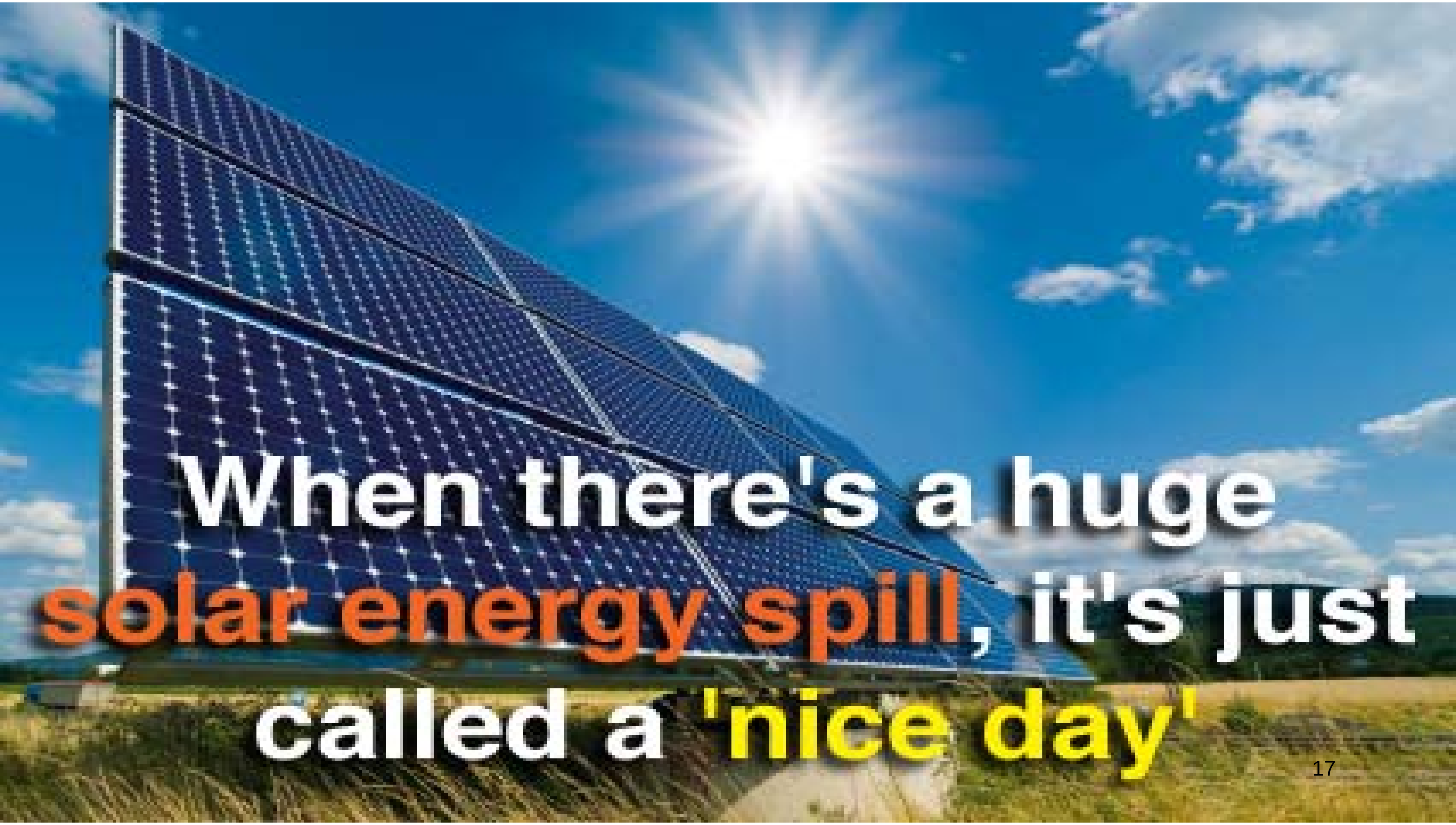
# Target, Actual and Projected Installations

- The goal for 2020 is to reach 1,054,000 SQM of installed solar water heaters
- Until 2016, the yearly goal has been surpassed
- Additional effort is required to reach the target for the coming years



# Future Work

- Increasing awareness campaigns on the national level
- Private companies to start advertising their products and offers
- Closing the installed projects penetration gap between the areas
- Working towards solar ordinances
- Including heat pumps in the mix to reach the set target
- Activating certification schemes such as SHAMCI in order to give local products visibility and to give clients confidence in their quality


When there's a huge
solar energy spill, it's just
called a 'nice day'

# Thank You!

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المركز اللبناني لحفظ الطاقة
*efficient resources, sustainable achievements*

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