



Sampling Design and Survey Weights
Transition to Clean Energy Enterprise
Survey- Egypt 2023

Transition to Clean Energy Enterprise Survey

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*for the Arab Countries,
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**Renewable Energy Egypt:
Sampling design and survey weights
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This document describes sampling design and survey weights of the survey of Renewable Energy in Egypt.

Sampling design

Target population and Sampling frame

The target population of the surveys was businesses with less than 100 employees that started business operations before 2023. Businesses that started their operations during 2023 were not eligible for the survey. An ideal sampling frame for a probability sample should cover all target population units, i.e., a list of all working businesses of size 100 employees or less that started operations before 2023 with their telephone numbers. Unfortunately, we could not find such list in Egypt. Therefore, we used data from Egypt Yellow Pages - (<https://yellowpages.com.eg/en>). We had access to the complete list of about 288,712 businesses from a broad list of business sectors. We compiled the list of all businesses from the Yellow Pages that included business names, addresses and telephone numbers. Although the sampling frame does not necessarily cover all businesses in Egypt, it is large enough and cover many business sectors. Unfortunately, we could not assess the coverage of the sampling frame especially with the lack of official numbers about our target population in Egypt.

Sample design and selection

A systematic random sample of 20,623 businesses were selected. The sample was implicitly stratified according to provinces and business sectors. See Table 1 for allocation of businesses in Yellow Pages frame and selected sample by provinces and regions. Apart from Cairo, Alexandria, Giza and Kaliobeya which have large number of businesses in the Yellow Pages, the other provinces are in three regions as follows:

- Lower Egypt: Beheira, Damietta, Kafr el sheikh, El dakahleya, Gharbeya, Monofeya, and Sharkeya.
- Upper Egypt: Assyout, Benisuef, Luxor, Menia, Qena, Sohag, Aswan, and Fayoum
- Other provinces/areas: Matrouh, Port said, Suez, Taba, Dahab, El wadi el gadid, Hurghada, Ismaileya, Marsa alam, North coast, North sinai, Nuweibaa, Quseir, Red sea, Safaga, Sharm el sheikh, Siwa oasis, Sokhna, and South sinai.

Table 1: Sample allocation of businesses in Yellow Pages frame and selected sample by provinces/regions

Provinces/regions	Businesses in sampling frame	Businesses selected
Cairo	122046	8718
Alexandria	22955	1640
Giza	75912	5422
Kaliobeya	18099	1292
Lower Egypt	36060	2577
Upper Egypt	358	4993
Other provinces	616	8647
Total	288712	20623

Survey implementation

Up to three calls were attempted to contact phone numbers that did not answer or busy lines. Table 2 presents the distribution of the selected businesses according to the final status after the three attempts.

Table 2: Distribution of selected samples according to the final contact

Final contact result	n	%
Phone disconnected/ busy	1136	5.51%
Not in service	7576	36.74%
Did not answer	2006	9.73%
Picked up and refused	5686	27.57%
Incomplete and refused	2025	9.82%
Incomplete and call returned	23	0.11%
Complete	1002	4.86%
Company size is ineligible	193	0.94%
Someone who cannot tell about the business earnings and employees, and did not give phone number of someone who can	870	4.22%
The owner's company is the government	19	0.09%
The establishment year is 2023	15	0.07%
Someone who cannot tell about the business earnings and employees, but gave phone number of someone who can	58	0.28%
Canceled by quality check	14	0.07%

Final contact result	n	%
Total	20623	100.00%

Survey weights

The weight calculations started by calculating design weights that reflect the selection probabilities of selecting the businesses from the sampling frame. Because a simple systematic sample was selected from the frame, the design weights were calculated as the inverse of the overall selection probability of businesses as follows:

$$W_j^0 = \frac{M}{m}$$

where M is the total number of businesses in the Yellow Pages, and m is the number of businesses selected for the survey.

The design weights were adjusted for nonresponse among eligible phone numbers, including numbers without known eligibility. Eligible cases are defined in Table 3. A nonresponse adjustment factor was calculated as the inverse of the weighted response rates by provinces/regions as follows:

$$A_c = \frac{\sum_{c=1}^{E_c} W_{cj}^0}{\sum_{c=1}^{E_c} W_{cj}^0 R_{cj}}$$

where E_c is the number of eligible businesses in province/region c , R_{cj} identifies the completed businesses among eligible businesses, where $R_{cj} = 1$ for businesses who completed the survey and $R_{cj} = 0$ otherwise. The adjusted weight for nonresponse was then calculated as:

$$W_j^1 = W_j^0 A_c$$

The survey weight was then calculated as a normalized version of W_j^1 as follows:

$$W_j^2 = \frac{W_j^1 n_{comp}}{\sum_{j=1}^{n_{comp}} W_{cj}^1}$$

where n_{comp} is the total number of businesses completed the survey.

Table 3: Final contact results by eligibility status

Final contact result	Eligibility	R_{cj}
Phone disconnected/ busy	Unknow eligibility	0
Not in service	Ineligible	NA

Did not answer	Unknow eligibility	0
Picked up and refused	Eligible non-respondent	0
Incomplete and refused	Eligible non-respondent	0
Incomplete and call returned	Eligible non-respondent	0
Complete	Eligible respondent	1
Company size is ineligible	Ineligible	NA
Someone who cannot tell about the business earnings and employees, and did not give phone number of someone who can	Eligible non-respondent	0
The owner's company is the government	Ineligible	NA
The establishment year is 2023	Ineligible	NA
Someone who cannot tell about the business earnings and employees, but gave phone number of someone who can	Eligible non-respondent	0
Canceled by quality check	Eligible non-respondent	0