



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

Transition to Clean Energy Enterprise Survey

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*for the Arab Countries,
Iran and Turkey*

**Renewable Energy Jordan:
Sampling design and survey weights**

Mahmoud Elkasabi, PhD

This document describes sampling design and survey weights of the survey of Renewable Energy in Jordan.

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 Jordan. Therefore, we used data from Kinz - (<https://kinz.jo/>), which is a website for a data mining Jordanian corporate, which had a larger list of businesses than the Yellow Pages in Jordan. The website grant access to subscribers. We had access to the complete list of about 82,000 businesses from 15 broad business sectors, such as Agricultural & Farming, Arts, Sports & Entertainments, Commerce, Education, ..., etc. Lists of businesses are presented in about 8,206 pages (10 businesses per page). We directly selected the sample from the Kinz webpages, where a random sample of pages within each business sector was selected for the survey, and all businesses in the selected pages were contacted. The frame included business names, addresses and telephone numbers. Although the sampling frame does not necessarily cover all businesses in Jordan, 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 Jordan.

Sample design and selection

A stratified sample of 5,884 businesses were selected. The sample was stratified according to 15 business sectors. The sample was selected in two stages; in the first stage, 600 pages were selected from the Kinz website, where the selected pages were proportionally distributed to the distribution of all pages by business sector. In the second stage, all businesses in selected pages were contacted. In average, there are 10 businesses per page. See Table 1 for sample allocation of pages by business sector.

Table 1: Sample allocation of pages by business sector

Business sector	Pages in sampling frame	Pages selected	Firms selected
Agricultural & Farming	27	3	30
Arts, Sports & Entertainment	75	8	80
Commerce	3206	110	1097
Education	660	64	638
Engineering, Contracting, and Real Estate	491	48	471
Health & Social Work Activities	1038	101	942
Hospitality, Travel, and Tourism	676	66	637
Industry	592	58	579
IT	88	9	89
Law Firms	265	26	260
Marketing	77	8	79
Printing & Publishing	81	8	80
Professionals, Scientific & Technical Activities	473	46	455
Support Services activities	245	24	238
Transportation and Shipping	212	21	209
Total	10196	600	5884

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	343	5.83%
Not in service	790	13.43%
Did not answer	1136	19.31%
Picked up and refused	1372	23.32%
Incomplete and refused	612	10.40%
Incomplete and call returned	187	3.18%
Complete	1000	17.00%

Final contact result	n	%
Company size is ineligible	48	0.82%
Someone who cannot tell about the business earnings and employees, and did not give phone number of someone who can	345	5.86%
The owner's company is the government	9	0.15%
The establishment year is 2023	13	0.22%
Someone who cannot tell about the business earnings and employees, but gave phone number of someone who can	16	0.27%
Canceled by quality check	13	0.22%
Total	3134	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. As described earlier, frame pages were selected within each business sector, and all businesses within selected pages were called. Therefore, the design weights were calculated as the inverse of the overall selection probability of businesses as follows:

$$W_{hj}^0 = \frac{M_h}{m_h}$$

where M_h is the total number of pages from stratum h in the Kinz frame (strata are business sectors), m_h is the number of pages selected from stratum h .

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 business sectors 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 business sector 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. R_{cj} by final status are defined in Table 1. The adjusted weight for nonresponse was then calculated as:

$$W_{hj}^1 = W_{hj}^0 A_c$$

The survey weight was then calculated as a normalized version of W_{hj}^1 as follows:

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

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