



CENTRAL INTELLIGENCE AGENCY
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Publications
THE WORLD FACTBOOK

COUNTRY COMPARISON :: ELECTRICITY - CONSUMPTION

This entry consists of total electricity generated annually plus imports and minus exports, expressed in kilowatt-hours. The discrepancy between the amount of electricity generated and/or imported and the amount consumed and/or exported is accounted for as loss in transmission and distribution.

RANK	COUNTRY	(KWH)	DATE OF INFORMATION
1	China	4,693,000,000,000	2011
2	United States	3,741,000,000,000	2009 est.
3	European Union	3,037,000,000,000	2009 est.
4	Japan	859,700,000,000	2011 est.
5	Russia	857,600,000,000	2008 est.
6	India	600,600,000,000	2008 est.
7	Canada	549,500,000,000	2008 est.
8	Germany	544,500,000,000	2008 est.
9	France	480,900,000,000	2008 est.
10	Brazil	455,700,000,000	2010 est.
11	Korea, South	455,100,000,000	2011 est.
12	United Kingdom	344,700,000,000	2008 est.
13	Italy	309,900,000,000	2010 est.
14	Spain	267,500,000,000	2008 est.
15	Australia	225,400,000,000	2008 est.

CIA – United States Info

Electricity - from fossil fuels:	75.5% of total installed capacity (2010 est.) country comparison to the world: 85
Electricity - from nuclear fuels:	9.9% of total installed capacity (2010 est.) country comparison to the world: 21
Electricity - from hydroelectric plants:	7.7% of total installed capacity (2010 est.) country comparison to the world: 118
Electricity - from other renewable sources:	4.8% of total installed capacity (2010 est.) country comparison to the world: 37
Crude oil - production:	9.023 million bbl/day (2011 est.) country comparison to the world: 4
Crude oil - exports:	43,800 bbl/day (2009 est.) country comparison to the world: 46
Crude oil - imports:	9.013 million bbl/day (2009 est.) country comparison to the world: 2

Electricity - from fossil fuels:
75.5% of total installed capacity (2010 est.) country comparison to the world: 95
Electricity - from nuclear fuels:
9.9% of total installed capacity (2010 est.) country comparison to the world: 21
Electricity - from hydroelectric plants:
7.7% of total installed capacity (2010 est.) country comparison to the world: 118
Electricity - from other renewable sources:
4.8% of total installed capacity (2010 est.) country comparison to the world: 37
Crude oil - production:
9.023 million bbl/day (2011 est.) country comparison to the world: 4
Crude oil - exports:
43,800 bbl/day (2009 est.) country comparison to the world: 48
Crude oil - imports:

CIA – United States Info

COUNTRY COMPARISON :: CRUDE OIL - IMPORTS

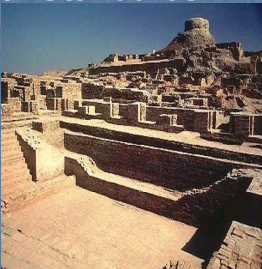
This entry is the total amount of crude oil imported, in barrels per day (bbl/day). [download data](#)

United States :: [2](#)

RANK	COUNTRY	(BBL/DAY)	DATE OF INFORMATION
1	World	41,790,000	2009 est.
2	United States	9,013,000	2009 est.
3	China	4,076,000	2009 est.
4	Japan	3,384,000	2009 est.
5	India	2,768,000	2009 est.
6	Korea, South	2,302,000	2009 est.
7	Germany	1,961,000	2009 est.
8	Italy	1,526,000	2009 est.
9	France	1,428,000	2009 est.
10	Spain	1,046,000	2009 est.
11	Netherlands	964,100	2009 est.

Measurements of Antiquity Compliance of Standards

- The inhabitants of the Indus Valley Civilization (c. 3000–1500 BCE, Mature period 2600–1900 BCE) developed a sophisticated system of standardization, using weights and measures, evident by the excavations made at the Indus valley sites. This technical standardization enabled gauging devices to be effectively used in angular measurement and measurement for construction. Calibration was also Babylonian and Egyptian records and the Bible indicate that length was first measured with the forearm, hand, or finger and that time was measured by the periods of the sun, moon, and other heavenly bodies



[1]

Objectives

- Florida's Rules regarding Electric Meter Tests.
- Preparing for the Electric Meter Test.
- Performing the Electric Meter Test.
- Meter Testing** Calibration of self-contained meters as well as transformer rated meters.
- Documentation

Florida's Rules

Specific Authority 366.05(1) FS. Law Implemented 366.05(3), (4), (5) FS. History—New 7-29-69, Amended 10-11-83, Formerly 25-6.59, Amended 7-3-06.

- 25-6.059 Meter Test by Request.

Rule Number	Description	Effective Date
25-6.050	Location of Meters	7/29/1969
25-6.052	Test Procedures and Accuracies of Consumption Metering Devices	7/3/2006
25-6.054	Laboratory Standards	5/19/1997
25-6.055	Portable Standards	5/19/1997
25-6.056	Metering Device Test Plans	7/3/2006
25-6.058	Determination of Average Meter Error	7/3/2006
25-6.059	Meter Test by Request	7/3/2006
25-6.060	Meter Test - Referee	7/3/2006

Florida's Rule

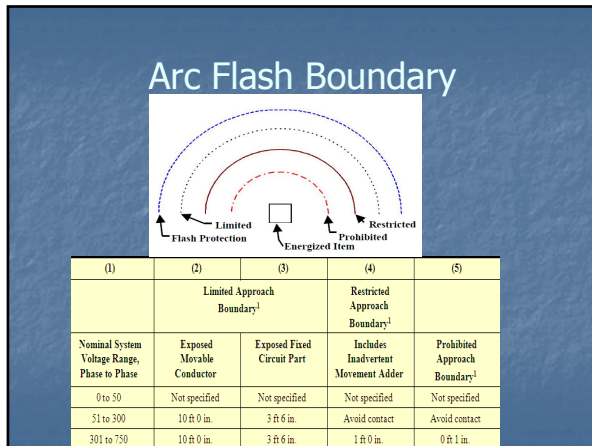
- 25-6.059 Meter Test by Request.
- (1) **Upon request of a customer, the utility shall, without charge, make a test of the accuracy of the meter in use at his premises provided that the meter has not been tested by the utility or the Commission within twelve (12) months previous to such request. This may be a shop test.**
- (2) Should any customer request a meter test more frequently than provided for in subsection (1) of this rule, the utility may require a deposit to defray costs of testing, such deposit not to exceed one hundred dollars (\$100.00) for each test. If the meter is found to be running fast in excess of the allowable limit the deposit shall be refunded, but if the meter is below the allowable limit, the deposit may be retained by the utility as a service charge for conducting the test.
- (3) If the customer so desires, he or his authorized representative shall have the privilege of witnessing the test. A written report giving the results of the test shall be furnished to the customer upon request.

- (4) At the request of the customer, the utility shall make arrangements for a meter test to be conducted by an independent meter testing facility of the customer's choosing. **The customer shall be responsible for negotiating and paying to the independent meter testing facility any fee charged for such a test.** Such independent meter testing facilities shall, at a minimum, conform to the requirements of the American National Standard for Electric Metering, Code for Electricity Metering (ANSI C12.1 2001), which is incorporated herein by reference. Where appropriate, the meter may be field tested. The customer shall be responsible for all the costs incurred by the utility related to a meter test by an independent testing facility. The utility shall provide a detailed estimate of costs the utility expects to incur related to the meter test and may require payment of such costs prior to the actual meter test. The customer shall provide to the utility a detailed estimate of charges from the independent testing facility for the meter test prior to the actual test. If the meter is found to be running fast in excess of the limits established by these rules, any payment collected by the utility related to the meter test shall be refunded, but if the meter is found to be within the limits established by these rules, the utility may retain any payments collected by the utility related to the meter test.
- (5) The utility may, at its discretion, conduct its own test of the meter in conformance with the testing standards established by these rules. In the event that separate tests of the same meter conflict as to whether the meter meets the accuracy standards established by these rules, at the request of the utility or the customer, the Commission will resolve the matter.
- (6) For equipment tested under this rule, any previous accuracy test result on record at the time the meter test is requested must be retained in accordance with Rule 25-6.022, F.A.C.

[4]

- ### Before getting started verify your "Documentation"
- Verify the address
 - Notify the customer that you are on their premises
 - Verify meter info (form, type, voltage rating, and readings)
 - Service History
 - Reason for work order

- ### Setting the Standard for Metering
- The Customer**
- Safety First !!!
 - Respect the customers property and equipment
 - Pick-up the trash.
 - Report Hazards. (Take caution on what you say to the customer)



- ### Reasons for Electric Meter Testing
- Compliant with ANSI/ASQC Z1.4 Standards
 - Receipt inspection for new meters
 - Monitoring of meter population-related parameters (broken glass, damaged base, etc.) for in-service testing or receipt inspection
 - Simple in-service testing plans (Florida's Rule FI 25-6.056)
 - Customer Complaint's

- ### Electric Meter Test
- Why is testing for accuracy important?
 - Comparison Test
 - Connecting the Meter for Test
 - Testing the meter for accuracy
 - Making Adjustments

Preparing for the Accuracy Test

- Field Testing
- Mobile Lab Testing

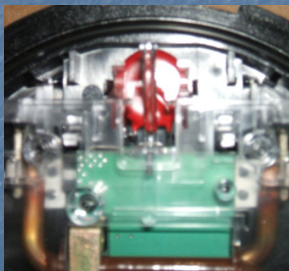


[8]

Connecting the Electric Meter

- Field Comparison Test
- Bypass the customers Load.
- Connect a phantom load between the meter and the comparison standard.
- Voltages are in parallel and currents are in series.
- Test for accuracy.

Test Pick-ups



Test Pick-ups

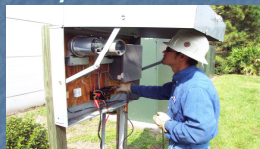


Meter Testing

- Test for Full Load (FL) and Light Load (LL)
- Demand test
- Verify the program if applicable

Meter Accuracy Test

- $(K_h \times \# \text{ revs}) / \# \text{ elements} = \text{calculated}$
- $3.6 \times 10 / 3 = 12$
- $(\text{Calculated} / \text{Actual}) \times 100 = \% \text{ Accuracy}$
- $(12 / 11.9941) \times 100 =$
- 100.05 %



Registration/Demand Test

- $(Kh \times \# \text{ revs} \times \# \text{ demand intervals}) / 1000$
- $(3.6 \times 25 \times 4) / 1000 =$
- .36



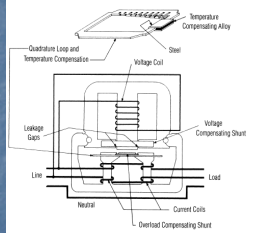
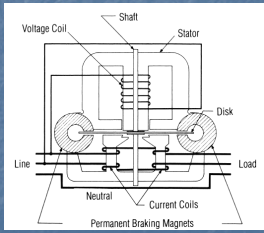
Result



Adjustments

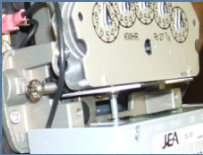
- **Mechanical Meters**
- Full load adjustments
- Light load adjustments
- **Electronic Meters**
- Software
- Offset adjustments

Adjustments (Mechanical Meters)



[9]

Full Load



Light Load



Documentation

- Maintain the last test result of the meter.
- Florida Law
- Document "As Found" and "As Left" Tests

Florida's Law

Specific Authority: 386.05(1) FS, Law Implemented 386.05(1), (2), 386.04(2)(f) FS, History—Amended 7-29-89, Formerly 25-6.22, Amended 5-19-97, 7-3-06.

■ 25-6.022 Record of Metering Devices and Metering Device Tests.

- (1) For all types of utility-performed tests, a test record shall be made whenever a unit of metering equipment is tested, but need not be retained after the equipment is again tested unless the test is made in accordance with Rule 25-6.059 or Rule 25-6.060, F.A.C. When equipment accuracy testing is required under Rule 25-6.059 or Rule 25-6.060, F.A.C., any record of accuracy testing for disputed equipment that is on file at the time the customer request is made under Rule 25-6.059 or Rule **25-6.060, F.A.C., must be retained until the dispute is resolved. The record shall show information to identify the unit and its location; equipment with which the unit is associated; the date of the test; reason for the test; readings before and after the test;** if the meter creeps, a statement as to the rate of creeping; a statement of the "as found" accuracy; indications showing that all required checks have been made; a statement of repairs made, if any; and identification of the person making the test. The completion of each test will signify the "as left" accuracy falls within the required limits specified in Rule 25-6.052, F.A.C., unless the meter is to be retired.

- (2) **Each utility shall keep a record for each unit of metering equipment showing the date the unit was purchased, if available; the utility's identification; associated equipment; essential name plate data; date of test; results of "as found" test; and location where installed with date of installation.**

- (3) Records of Test for Incoming Purchases. Regardless whether the newly purchased metering equipment is tested under a Random Sampling Plan approved pursuant to Rule 25-6.056, F.A.C., each utility shall maintain and **make available to the commission** for each purchase of new meters and associated devices made during the calendar or fiscal year, the following information:
 - (a) Type of equipment, including manufacturer, model number, and any features which will subsequently be used to classify the units purchased into a population of units for in-service tests;
 - (b) The number of units purchased;
 - (c) The total number of units tested;
 - (d) The number of units tested measuring each percent registration recorded;
 - (e) Average percent registration;
 - (f) Standard deviation about the average percent registration (population or sample standard deviation);
 - (g) Results regarding whether the units tested meet the utility's acceptance criteria; and
 - (h) If a utility does not perform its tests for incoming purchases, the data provided by equipment manufacturers concerning units tested on a 100 percent basis by the manufacturer, with the manufacturer's test results used as a basis for acceptance testing, shall also be retained.

- (4) **Records of Periodic and Annual In-Service Meters Tests.** Each utility shall maintain test records for each periodic and annual in-service test of electric meters and associated devices in such a manner that the information listed in paragraphs (4)(a) through (h) is readily available to the Commission on request. These data shall be maintained for units of metering equipment tested under **approved Random Sampling Plans and for units tested under periodic testing programs, and shall be summarized on an annual basis.**
 - (a) Type of equipment, including manufacturer, model number, and any features that are currently used to classify the units tested into a population of units for in-service tests;
 - (b) The number of units in the population;
 - (c) The total number of units tested;
 - (d) The number of units tested measuring each percent registration recorded;
 - (e) Average percent registration;

- (f) Standard deviation about the average percent registration (population or sample standard deviation);
- (g) Results showing whether the units tested under an approved random sampling program meet the utility's acceptance criteria; and
- (h) A statement of the action to be taken to make further tests or replace inaccurate units, when the units tested under an approved random sampling program do not meet the acceptance criteria.
- (i) The information regarding units tested during the year but not tested under a Random Sampling Plan or a periodic testing program need not be maintained as listed in paragraphs (4)(a) through (h) or be summarized on an annual basis.

- ## Conclusion
- Florida's Laws regarding Electric Meter Tests.
 - Basic Operation of an Electric Meter.
 - Performing the Electric Meter Test.
 - Documentation

Questions ???

Citations -

- 1. http://www.psc.state.fl.us/consumers/tips/tipoftheweek.aspx?tipDate=2007_12_29
- 2. <http://www.rules.org/gateway/ChapterHome.asp?Chapter=256-578>
- 3. <http://www.edison-electric.com>
- 4. <http://www.edison-electric.com>
- 5. <http://www.edison-electric.com>
- 6. Handbook for Electricity Metering—Tenth Edition, p. cm. Includes index. ISBN 0-931032-52-0, 2002. BY EDISON ELECTRIC INSTITUTE

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Rank Order - Electricity - consumption

Home Reference Maps Appendixes Download Datafile

Countries for which no information is available are not included in this list.

Rank	Country	Electricity - consumption (kwh)	Date of information
1	World	16,830,000,000,000	2005 est.
2	United States	3,816,000,000,000	2003
3	China	2,859,000,000,000	2006
4	European Union	2,820,000,000,000	2004 est.
5	Russia	985,200,000,000	2007 est.
6	Japan	974,200,000,000	2005
7	Germany	545,500,000,000	2005
8	Canada	540,200,000,000	2005
9	India	488,500,000,000	2005
10	France	451,500,000,000	2005
11	Korea, South	368,600,000,000	2007

