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IID, Inc.

FOR IMMEDIATE RELEASE

Publication of e-Denpi Report 2014-15

Published: Results of study on actual use of electric vehicles, based on driving data from owners of Nissan Leafs throughout Japan11

IID announced to the public e-Denpi Report 2014-15, a report compiled with the cooperation of Nissan Leaf owners from throughout Japan enrolled via the car fuel-economy management service e-Nenpi (http://e-nenpi.com) and the largest general automobile news site in Japan, Response (http://en.responsejp.com/).

The Japanese term nenpi means “fuel consumption”, while the term denpi means “power consumption.”
For the e-Denpi study, drivers attached the OBD II cable of their car to a dedicated communications terminal from the Japanese firm HKS Co., Ltd., which in turn is linkable with the smartphone application e-Denpi App. When the smartphone application is on, more than ten different parameters, such as residual battery charge and power recovery ratio, are shown on the screen in real time. After any personal information had been removed, the data was uploaded to the cloud, and the trip data and power-consumption log data were then analyzed to prepare the present report.

A summary version of the e-Denpi report, containing an outline of the results and a summary of the constituent data, is available free of charge. The complete version, containing the raw data and a detailed report (approx. 100 pages), is available for $ 5,000 plus tax. The summary version can be requested by going to
https://www.iid.co.jp/contact/english-contact.html
and registering one’s affiliation and contact information.

The next study is planned for September 2015.

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Overview of the study

Purpose: To collect data for research into the next generation of EV development and driving methods

Subjects: Nissan Leaf owners (43 in total) who, in response to an announcement, submitted applications to be e-Denpi monitors

Period of study: September 4 - December 9, 2014

Data collection method: From a communications terminal attached to the OBD II cable of the car were obtained more than ten real-time driving parameters, such as residual battery charge and power recovery ratio, as well as electrical-current log information.

Volume of data collected: 3,350 trips

Overview of the results

- Comparing earlier models to later models, the power consumption of earlier models was higher.
- When it came to achieving the car's rated range, i.e., the distance that can be driven on a full charge, earlier models averaged 107.8% of the rated range, while later models were also high at 89.6%.
- Breaking down the results by region, the power consumption rate was seen to be lowest in Shikoku, highest in Tokai.
- By age, the consumption rate was lowest for drivers in its 30s, highest for those in their 50s.
- By time of year, the consumption rate was lowest in September, highest in December.
- Average power consumption was highest in the case of average vehicle speeds below 10 km/h and lowest for average speeds in the range of 35-40 km/h, with the rate of consumption rising again at higher speeds.
- A greater number of sudden starts led to higher power consumption.

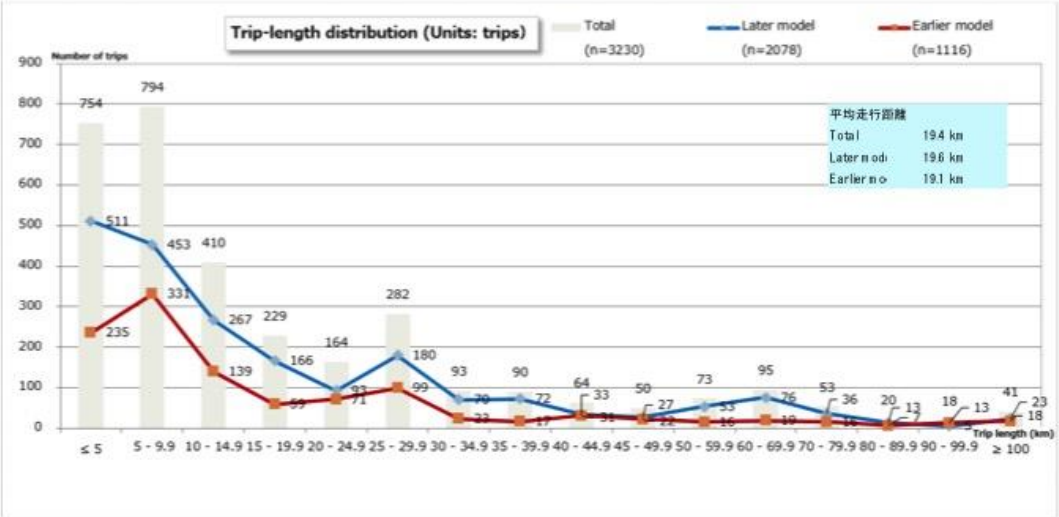
The report images

1. Outline

- **Purpose of the study:**
  - To obtain and analyze Nissan Leaf driving data via the *e-Denpi* application, and to use this in developing the next generation of electrical vehicles and researching driving methods.
- **Target drivers:**
  - Nissan Leaf owners who, in response to an announcement, submitted applications to be *e-Denpi* monitors, 43 drivers in total.
- **Data collection period:**
  - September 4 – December 9, 2014
- **Data collection method:**
  - Via Bluetooth the system links up with smartphones equipped with the *OB-LINK* application developed for the Nissan Leaf, and the Leaf's driving data are obtained in conjunction with the dedicated application *e-Denpi*.

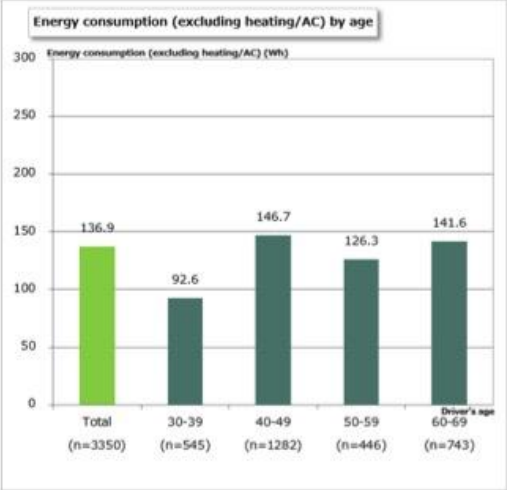
3.2.1. Trip-length distribution by vehicle model

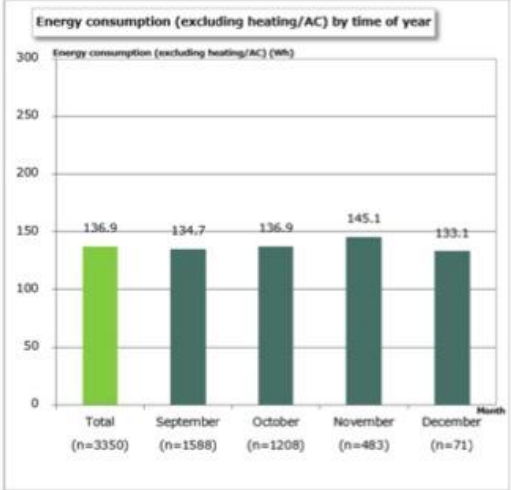
- Trips of 5–9.9 km and ≤ 5 km – i.e., "short hops" – were particularly numerous, while trips of 30 km or more were uncommon.
- Later-model vehicles averaged longer trips than earlier-model vehicles.



3.3.3. Energy consumption (excluding heating/AC) by age and time of year

- Energy consumption – like trip distance – was highest for drivers in their 40s, lowest for drivers in their 30s.
- Time of year had no discernible impact on energy efficiency, but as weather got colder energy efficiency tended to decline. (Due to the small number of samples for December, data for December are included only for the sake of comparison.)



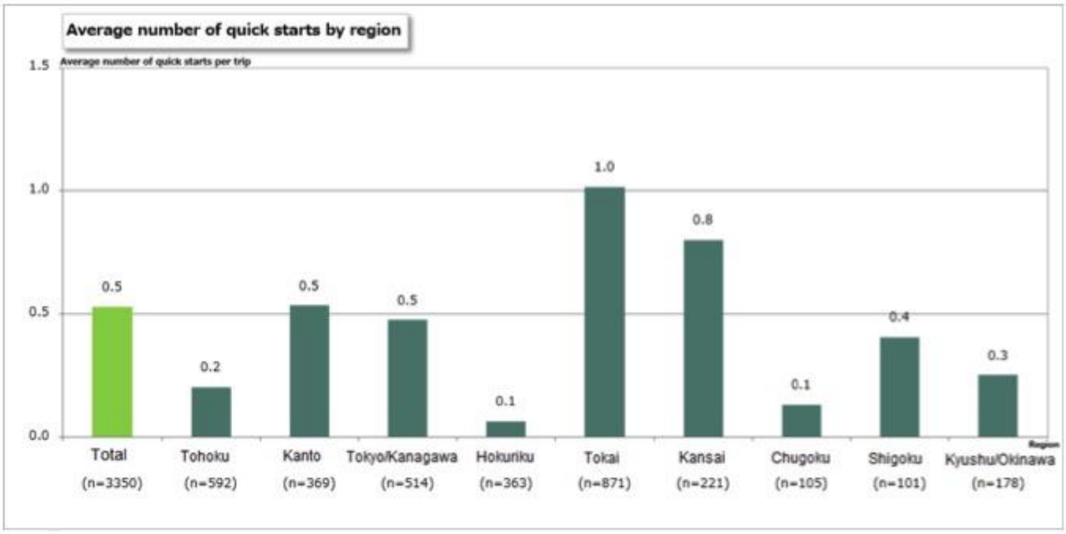


3.4.2. Energy consumption (excluding heating/AC) by average speed and vehicle model

- Energy consumption (excluding heating and air conditioning) was highest in the range of 50–55 km/h through 60–65 km/h, but tended to decline at higher speeds.

3.5.2. Average number of quick starts by region

- The average number of quick starts per trip was highest in Tokai, which had the second-highest average trip length, followed by Kansai, which did not have an especially high average trip length.
- Tokyo/Kanagawa, which had the highest average trip length, had an average of just 0.5 quick starts per trip.



3.7.1. Data for individual drivers

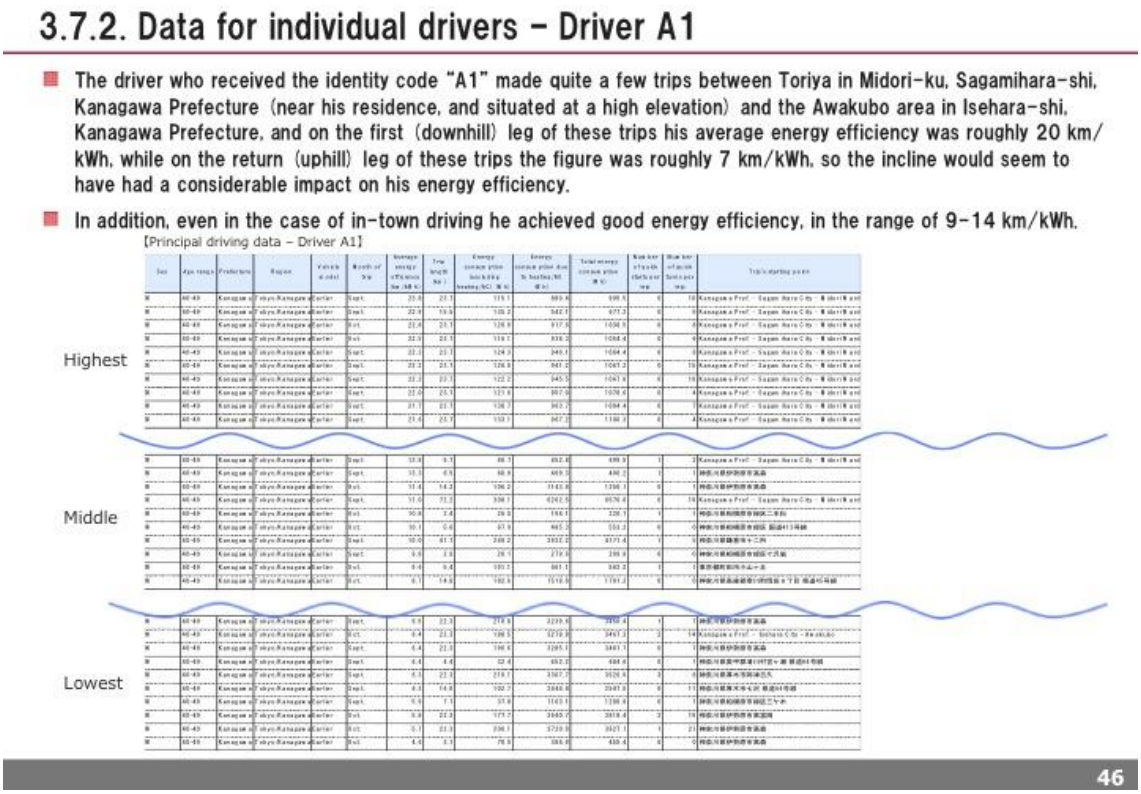
- Examining the data for individual drivers, in the case of drivers with the highest average energy efficiency no clear pattern is evident, but on the whole drivers whose energy consumption was low and who had few sudden starts had high energy efficiency.
- Nevertheless there are some drivers who, despite having neither low energy consumption nor a small number of sudden starts, had energy efficiency that was not low, but this may be due to other factors such as individual driving skill or road conditions.

*Data with average energy efficiency ≥ 31 km/k Wh have been removed.

	Number of data	Sex	Age range	Prefecture	Region	Vehicle model	Average energy efficiency (km/kWh)	Average trip distance (km)	Energy consumption (excluding heating/AC) (Wh)	Energy consumption due to heating/AC (Wh)	Total energy consumption (Wh)	Average number of quick starts per trip	Average number of quick turns per trip
	3350						8.7	18.4	136.9	2239.5	2376.4	0.5	4.8
A1	120	#	40-49	Kanagawa	Tokyo/Kanagawa	Earlier	11.2	18.3	133.2	2011.6	2144.7	0.3	8.3
A2	81	#	40-49	Tokushima	Shikoku	Later	11.0	23.5	159.1	2141.1	2300.2	0.6	4.1
A3	48	#	30-39	Ehime	Shikoku	Later	10.4	16.5	121.8	1529.0	1650.7	0.1	5.7
A4	46	#	50-59	Gunma	Kanto	Later	10.1	16.3	115.3	1740.4	1855.6	0.1	1.3
A5	36	#	30-39	Iwate	Tohoku	Earlier	10.0	9.1	60.4	849.1	909.6	0.0	1.4
A6	114	#	40-49	Kanagawa	Tokyo/Kanagawa	Later	9.8	20.6	194.3	1924.7	2119.0	0.2	2.8
A7	55	#	50-59	Gifu	Tokai	Later	9.7	50.6	393.1	5085.6	5377.7	0.1	14.8
A8	62	#	30-39	Osaka	Kansai	Earlier	9.5	[illegible]	75.1	703.2	778.3	0.2	0.7
A9	38	#	60-69	Tochigi	Kanto	Earlier	9.4	1.4	42.7	[illegible]	[illegible]	0.0	1.5
A10	173	?	unknown	Saitama	Kanto	Earlier	9.4	18.0	116.4	1842.9	1959.3	0.2	0.0
B1	21	#	50-59	Okinawa	Kyushu/Okinawa	Earlier	9.4	7.9	75.8	778.4	854.2	0.4	1.9
B2	234	#	40-49	Yamagata	Tohoku	Earlier	9.2	22.3	133.7	2359.2	2481.9	0.1	2.1
B3	39	#	unknown	Tokyo	Tokyo/Kanagawa	Later	9.2	84.0	321.7	5729.4	6051.1	0.2	4.9
B4	125	#	60-69	Kumamoto	Kyushu/Okinawa	Later	9.2	22.1	199.4	2255.7	2455.1	0.2	0.8
B5	282	#	30-39	Fukui	Hokuriku	Later	9.1	11.6	80.7	1306.7	1387.4	0.1	1.5
B6	15	#	unknown	Gifu	Tokai	Later	9.0	21.3	140.4	2340.4	2480.8	0.4	1.2
B7	75	#	30-39	Tochigi	Kanto	Earlier	9.0	16.4	125.5	1612.5	1738.0	0.3	1.7
B8	322	#	60-69	Fukushima	Tohoku	Later	8.8	14.6	87.3	1753.9	1841.2	0.3	6.9
B9	2	#	60-69	Yamaguchi	Chugoku	Later	8.6	133.4	717.9	11488.5	12204.5	3.0	11.5
B10	153	#	60-69	Tokyo	Tokyo/Kanagawa	Earlier	8.5	38.5	221.8	3708.4	4930.3	0.6	4.4
C1	22	#	40-49	Kagoshima	Kyushu/Okinawa	Earlier	8.5	12.1	85.4	1343.6	1430.1	0.3	1.2
C2	78	#	40-49	Aichi	Tokai	Earlier	8.4	13.9	86.7	1659.4	1746.1	0.0	0.4
C3	153	#	40-49	Okayama	Chugoku	Later	8.4	16.4	111.6	1781.0	1892.6	0.1	3.4
C4	371	#	40-49	Aichi	Tokai	Later	8.3	19.5	150.4	2307.4	2457.9	0.4	6.7
C5	103	#	60-69	Hyogo	Kansai	Earlier	8.1	16.8	132.7	1991.4	2124.1	1.3	2.2
C6	19	#	40-49	Kumamoto	Kyushu/Okinawa	Later	8.0	24.5	121.8	3181.1	3302.9	0.1	4.8
C7	44	#	40-49	Hyogo	Kansai	Later	7.9	29.1	212.8	3559.5	3772.3	0.5	32.4
C8	21	#	30-39	Kanagawa	Tokyo/Kanagawa	Later	7.8	17.6	205.6	2146.3	2351.9	0.4	1.8
C9	52	#	40-49	Toyama	Hokuriku	Later	7.7	26.9	108.5	3841.7	3950.0	0.0	2.2
C10	28	#	30-39	Fukui	Hokuriku	Earlier	7.7	6.8	77.4	1062.1	1139.5	0.2	1.4
D1	73	#	40-49	Aichi	Tokai	Later	7.6	55.6	241.0	[illegible]	[illegible]	2.4	14.9
D2	12	#	50-59	Osaka	Kansai	Earlier	6.8	5.8	25.9	829.2	855.1	0.2	0.3
D3	275	#	50-59	Shizuoka	Tokai	Later	6.6	12.6	106.0	1827.1	1933.0	2.0	6.8
D4	4	unknown	unknown	Niigata	Tokai	Earlier	6.4	15.4	180.1	2220.0	2400.1	0.0	0.0
D5	78	#	unknown	Kanagawa	Tokyo/Kanagawa	Earlier	6.4	26.6	214.3	3898.3	4172.5	1.0	2.3
D6	37	#	50-59	Chiba	Kanto	Later	6.2	9.4	95.7	1497.8	1593.4	3.0	3.1

Fewest/lowest
2nd fewest/lowest
3rd fewest/lowest
4th fewest/lowest
5th fewest/lowest

5th greatest/highest
4th greatest/highest
3rd greatest/highest
2nd greatest/highest
Greatest/highest



About e-Nenpi

e-Nenpi is a service that permits drivers to register from their mobile or smartphone and enjoy managing their car online economically and ecologically. The service provides a wide variety of content, such as calculation of actual fuel consumption, information on gas stations throughout Japan, and reviews by users.

e-Nenpi also provides a search engine for EV charging stations and hosts a public database of hydrogen stations for fuel-cell vehicles throughout Japan.

e-Nenpi is dedicated to supporting environmentally friendly driving.

Website: http://e-nenpi.com

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