



eCar Project



Electrified Fleet in your Business

Edinburgh College eCar Project Case Study

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Engineering+

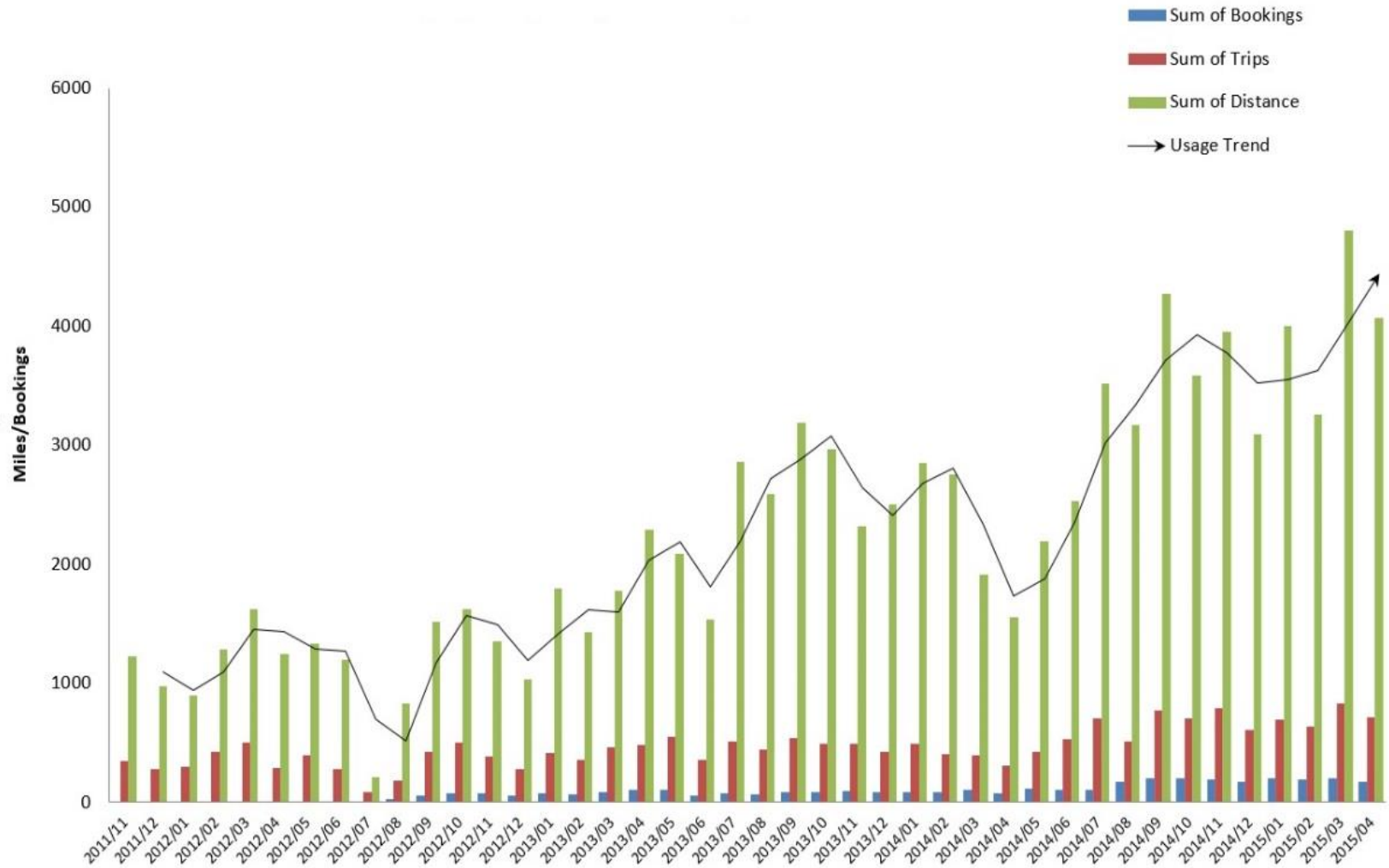
Current Status:

- 4 Nissan LEAFs
- 6 Mitsubishi i-MiEVs
- 500+ Staff members on Booking System
- 1 CCS Rapid Charger & 30 Type 2 'Fast' Charge Posts



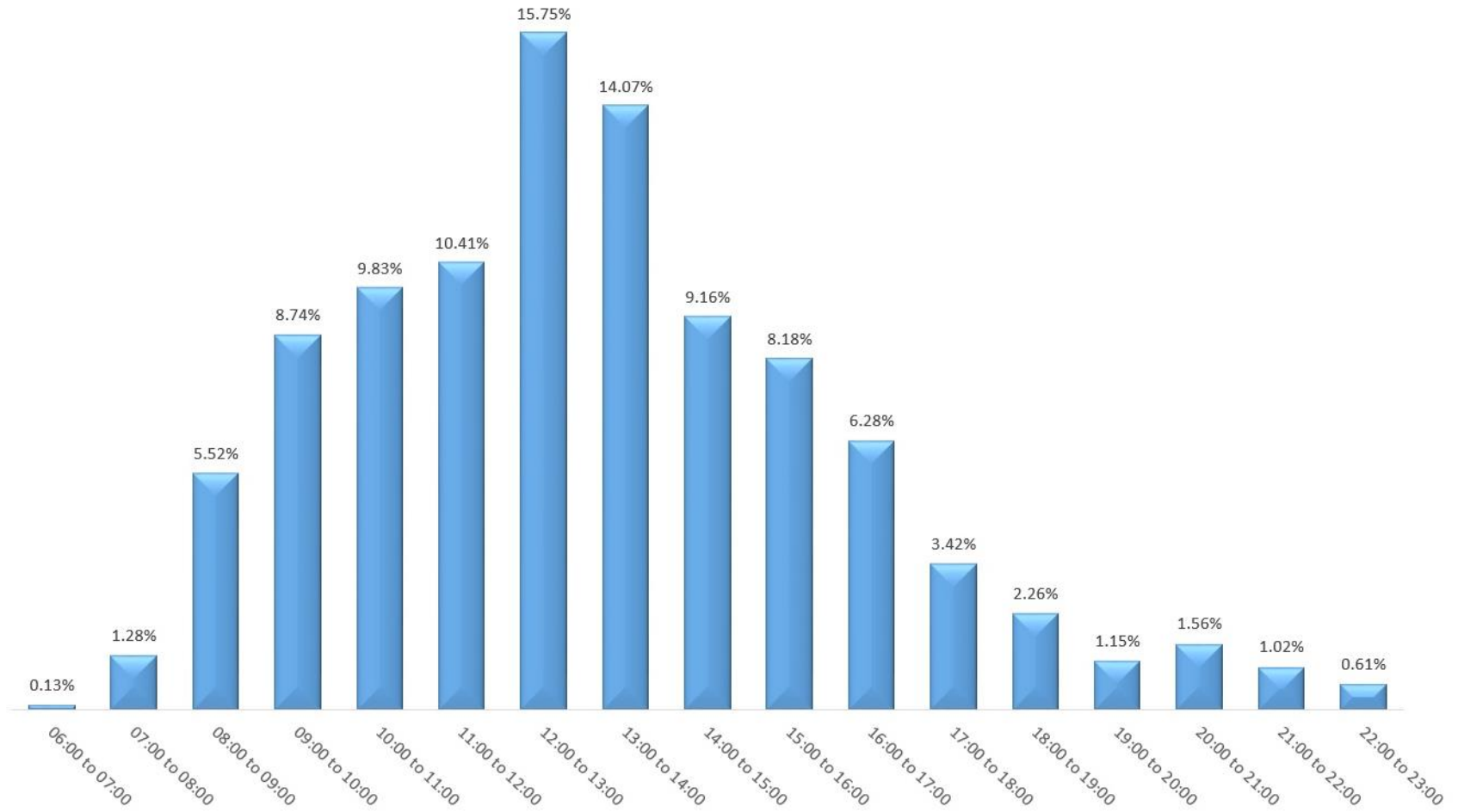
Usage:

Data from project start in November 2011 to April 2015. Whole Fleet.



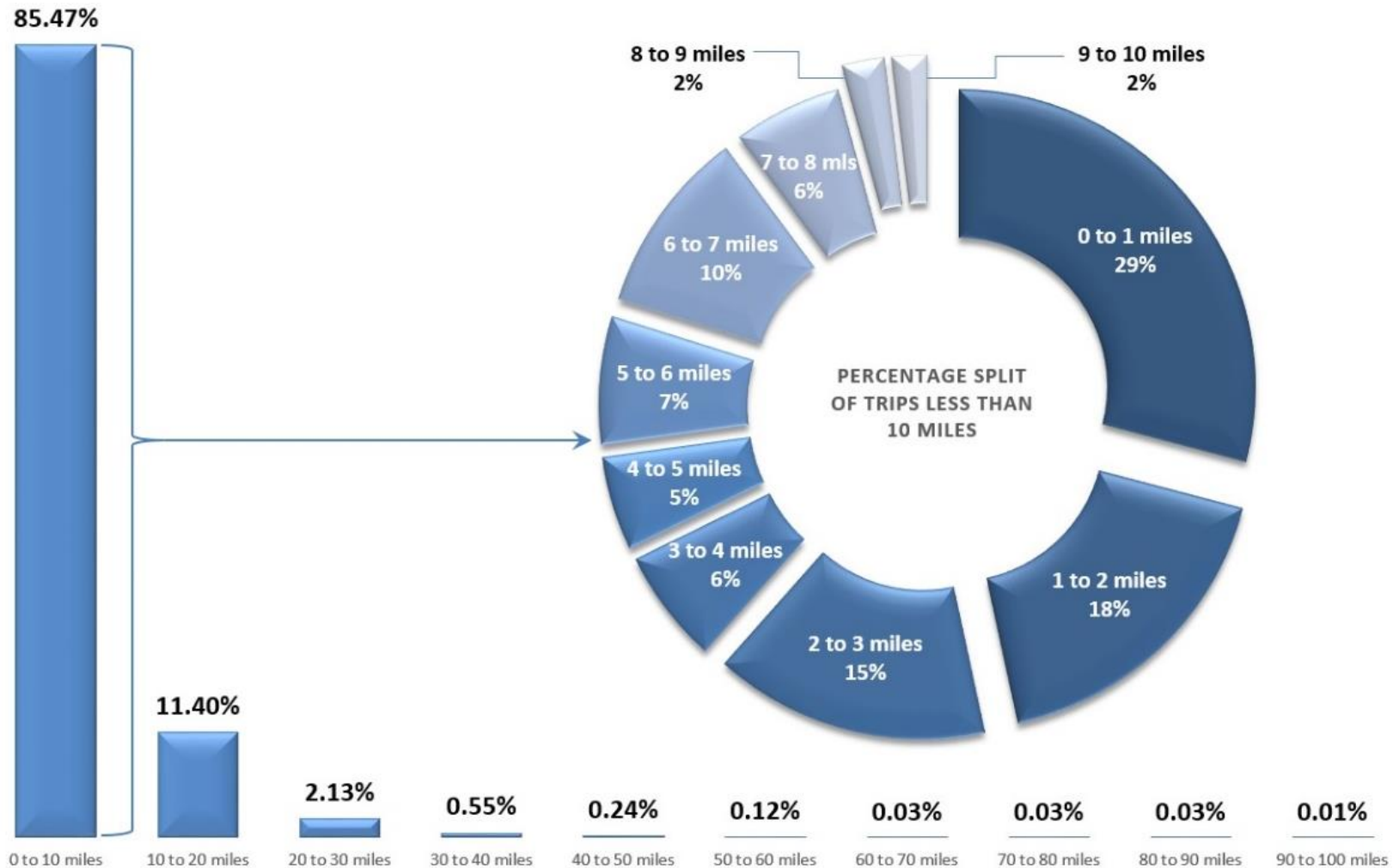
Usage:

Percentage of trips against time of travel



Usage:

PERCENTAGE OF TRIPS v MILES TRAVELLED PER TRIP - (19406 TRIPS RECORDED)



Tracking:



- Vehicles Monitored by www.trackyou.co.uk
- Real-time GPS Tracker fitted to each vehicle
- Allows monthly report to be downloaded detailing:
 - Number of Trips
 - Mileage travelled
 - Location
 - Speed
 - Time of travel
- Data gathered allows comparative route evaluations to be carried out (see next slides) and is used by students as part of their coursework.

Data Example:

2014 Nissan LEAF (BEV) Data

Route	Distance (miles)	Energy used (kWh)	Efficiency (miles per kWh)	Cost of recharge (£)*	Cost per mile (£)	CO ₂ emissions (kg)
Intercity (Winter)	71.6	22.4	3.20	1.42	0.0198	0.0
Extra Urban (Winter)	69.2	22.08	3.13	1.40	0.0202	0.0
Urban (Winter)	71.0	21.52	3.30	1.37	0.0197	0.0
Edinburgh to Bristol	357.0	99.6	3.58	0.00 ⁽¹⁾	0.0219 ⁽²⁾	0.0

* Assumes overnight charge at Night Rate for Edinburgh College of £0.063585 per kWh

(1) All electricity provided by Ecotricity Electric Highway posts is free of charge.

(2) Assuming energy is charged at day rate for the College (£0.078462 per kWh), the total trip cost would be around £7.81, giving a cost per mile figure of £0.0219.

Facts:

April 2014 to March 2015 snapshot:

- **Distance travelled:**
 - 36,937.3 miles
- **Cost of Energy:**
 - £635.78 (day rate)
 - £515.23 (night rate)
- **Number of bookings:**
 - 1925
- **Equivalent ICE cost:**
 - £5,370.68*
 - *based on 14p per mile running cost of ICE (eg. Ford Focus 1.6)
- **Average Trip Distance:**
 - 5.73 miles
- **CO₂ Emissions:**
 - Nil at 'Tailpipe' for EV
 - ICE = 8.0 Metric Tons*
 - *based on 136g/km emissions for typical family ICE car (eg. 2014 Ford Focus 1.6)
- **Energy Used:**
 - 8102.99 kWh*
 - *Data gathered from CYC backoffice
- **CO₂ from energy generation:**
 - 1.9 Metric Tons**
- **Miles per kWh:**
 - 4.56

**Estimated 235g CO₂eq/kWh Carbon Intensity

Source: <http://www.theccc.org.uk/wp-content/uploads/2015/01/Scotland-report-v6-WEB.pdf>



Facts:

Whole Project Overview, 2011 to date:

- **Bookings & Trips**
 - 3619 bookings
 - 19,406 trips
- **Distance travelled**
 - 2012 - 2013 = **14,140** miles
 - 2013 - 2014 = **27,326** miles *(+93% increase on 2012 – 2013 mileage)*
 - 2014 - 2015 = **36,937** miles *(+35% increase on 2013 – 2014 mileage)*
- Total 'electric only' distance travelled (to date) by Edinburgh College fleet since project began is **+95,200** miles
- **Total 'Grey Fleet' Fuel Expenses Savings** *(@ £0.45/mile)*
 - Approx. **£42,842**
- **Emissions saved since project start***
 - Over 21.0 metric tonnes of CO₂

**based on 136g/km emissions for typical family ICE car (eg. 2014 Ford Focus 1.6)*



Beginnings:

- Project began in August 2011 with delivery of 4 Mitsubishi i-MiEVs thanks to 'match funding' from SEStran. A 5th was added shortly thereafter
- Official Launch was September 2011, with subsequent realisation that no charging infrastructure was present.
- Between October and November 2011 Staff & Students designed and manufactured 3kw posts with domestic sockets.
- Scholarship offered as part of eCar Project



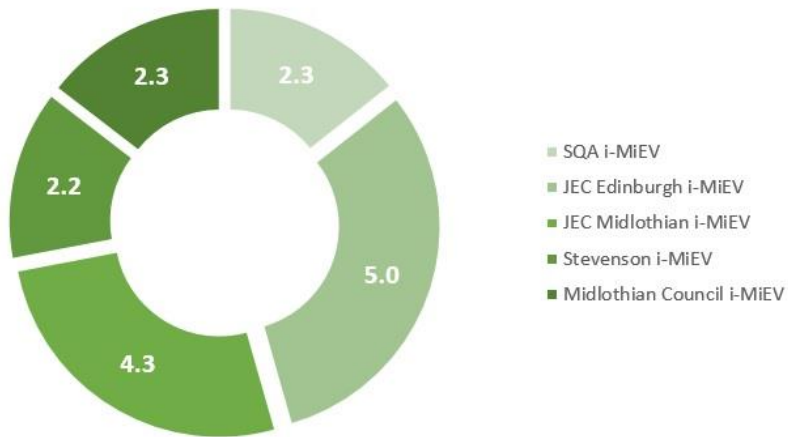
Evolution:

- December 2011 - eCar Booking system created Open-source software. 120 registered users by March 2012.
- Mid 2013 - Booking System updated. 500 registered users by March 2015.
- January 2014 – Multiple new charge posts installed at each campus through Plugged In Places' scheme.
- Free to use and publically available.
- June 2014 – EV fleet doubled in size. Increasing resource availability for staff.
- February 2015 - New Rapid Charger installed at Milton Road on A1 Corridor. Supported by ChargePlace Scotland.
- Edinburgh College active in Transport Scotland E-Cosse forums, and invited to take part in 'Switched On @ Work' initiative.

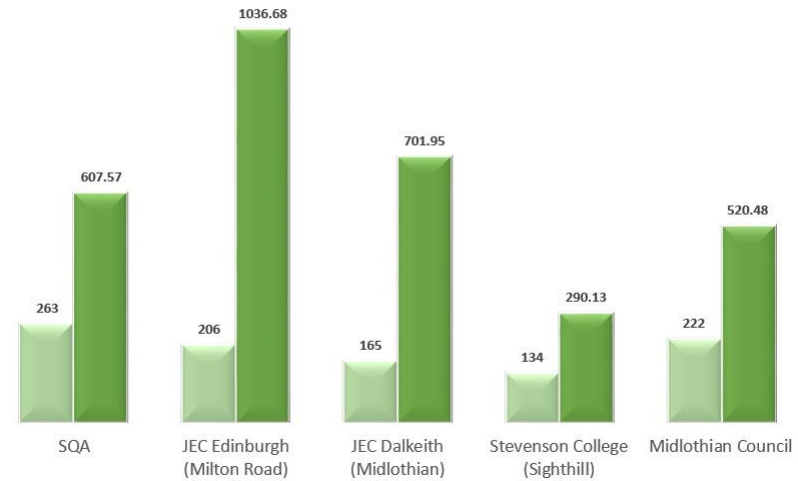


User Experience:

Dec 2011 to Feb 2012 Average Trip Distance (Miles)



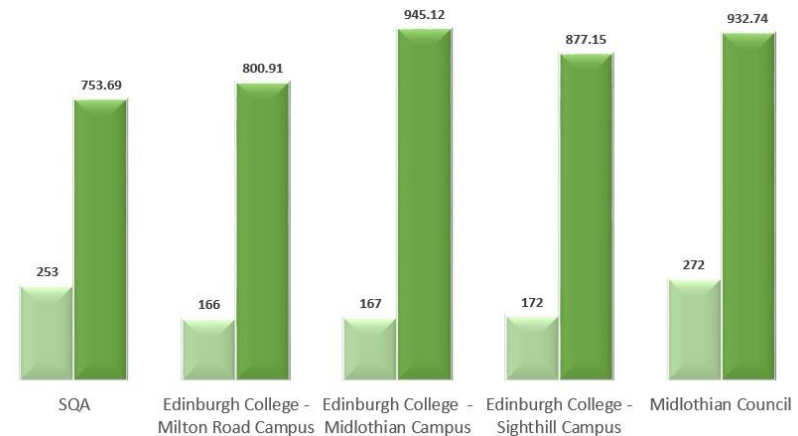
Trips
Distance (Miles)



Dec 2014 to Feb 2015 Average Trip Distance (Miles)



Trips
Distance (Miles)



Partners:



University of
St Andrews



Creating opportunities for Edinburgh and the Lothians