Electricity Distribution Debate Kit

Evaluation Report

March 2015

- **Every teacher who filled in the feedback survey found the kit to be an "excellent" or "pretty good" educational resource.**

- **97% of teachers feel their students know more about Electricity Distribution after using the kit.**

- **We measured how the students reflected on the issues surrounding electricity distribution and actually changed their minds throughout the debate.**

Contents

1. Introduction

This debate kit was funded by Western Power Distribution. Gallomanor accomplished the research required to develop the debate kit with advice from teachers. All the references used can be found in our website: debate.imascientist.org.uk/electricity

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The **kit discusses whether building pylons should be allowed so as to connect new electricity generation facilities, like wind farms, to the National Grid**. This question sets ground for the discussion all the issues surrounding Electricity Distribution. The kit shows students how complex this topic is, and encourages them to explore and think about some of the main concerns surrounding the ethics of energy distribution.

All the facts in the kit were researched and we linked teachers to a page with references and additional information relating to it. We also uploaded on YouTube a video to introduce students to the topic of electricity distribution (youtube.com/watch?v=1Z6p0D_G6JI).

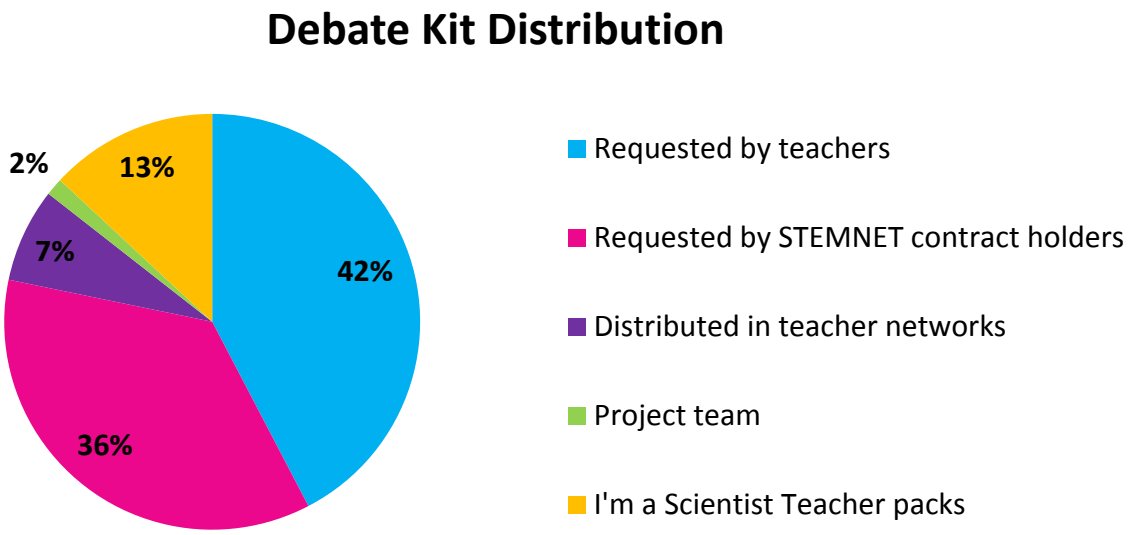
This kit includes yet one additional feature: we developed an **online tool to track how each class changes its views**. It is an online survey that teachers should fill at three different stages during the activity and it gives results at the end. Results are analysed in point 3.3 of this evaluation report.

2. Distribution

2,000 kits were printed in March 2014. **78% of the kits were requested**: **810 were posted out to teachers who requested them** in four different batches between March and June 2014, and **687 were sent to STEM Contract Holders who requested them**.

On top of these, 140 kits were sent to different teacher networks or distributed at the Welsh ASE Teacher Conference, 26 were distributed among the project team and Gallomanor kept 87 copies as spares and to distribute internationally to those interested in the debate kits. Debate kits were also sent to 250 teachers who took part *in I'm a Scientist, Get me out of here!* in March and June 2014 in the teacher packs. (See graph below.)

A PDF version of the debate kit is also available to download from our website: debate.imascientist.org.uk/files/2012/10/Electricity-Distribution-Debate-Kit-PDF.pdf. Up to date, the Electricity Distribution Kit has been **downloaded by 242 different people**, more times than any of our previous debate kits.



3. Usage

It is very important for us to know to what extent our debate kits reach our target audience. With the tools that we have, measuring the number of debate kits that have been used is the best way to get an idea of their global impact.

3.1 Usage – how many kits were used?

In order to get an accurate report of how many kits were used we asked a random sample of 100 teachers who'd requested an Electricity Distribution Debate Kit if they had used the kit. We then followed up non-responders with reminder emails, and a letter.

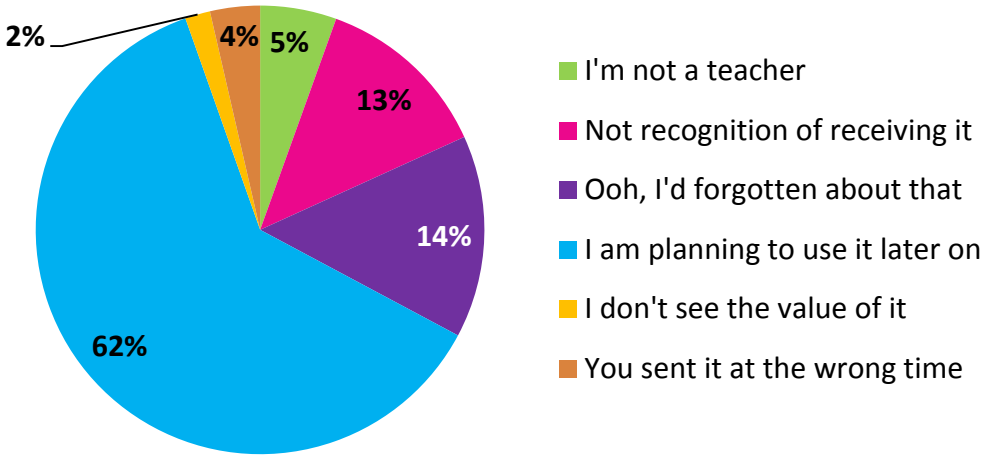
At the time of writing, **52 out of the randomised sample of 100 teachers have responded** to tell us if they've used the debate kit: **15 (29%) of them said they had used the kit**.

By extrapolating the percentage of randomly selected responders who'd used the kit up to the 810 teachers who requested kits, 29% of 810 gives an estimate of **235 kits used**.

We estimate that at least 29% of teachers that requested the kit have used it.

3.2 Usage – why some of the kits didn't get used?

All teachers who had requested an Electricity Distribution Debate Kit – not only the randomised control group – were sent the email in appendix 1 to ask them if they had used it. Teachers who clicked on the NO link were taken to a survey asking them why they hadn't used kit and calling upon comments or suggestions. Here are the results:



62% of the teachers that hadn't already used the debate kit were planning to use it later in the school year.

We sent a follow-up email to teachers who said they planned to use the kit in the following school year. However, only 25% of the teachers who replied to our email had used it by now. This emphasizes on the fact that is very important to send the kits on the right time of the year, as teachers would probably forget if they get at a less convenient time.

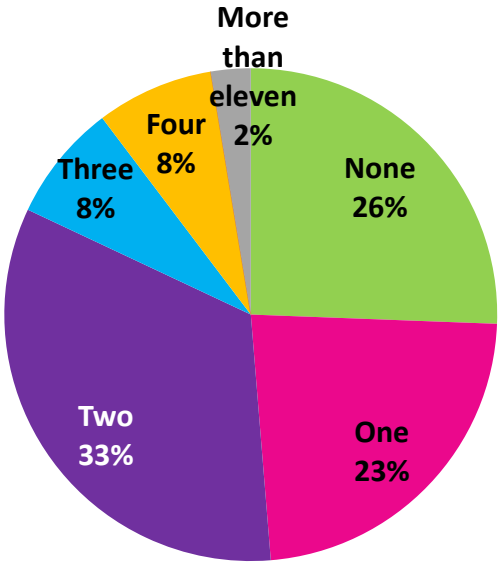
To make sure debate kits arrive to the schools, we ask teachers to confirm their address when they request a kit, and we send debate kits in self-addressed envelopes so they can be return to sender if needed. However, we get very few kits returned. In certain occasions, teachers email in to let us know that they haven't received the kit, and check if we have their correct address. It often arrives within a few days, or they find it somewhere else in their department.

3.3. Usage – how were the kits used?

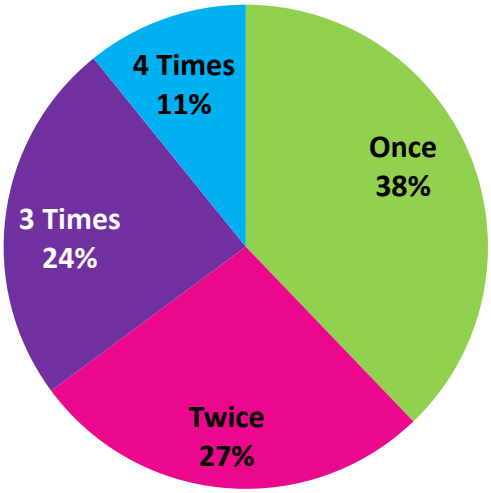
39 teachers who said they'd used the Electricity Distribution Debate Kit filled out the feedback survey about it and responded to certain questions on how they had used the kit.

The responses were very positive: **74% of them had already lent the kit to at least one colleague**. More than half of the teachers (**62%**) **said they had used the kit more than once**, **82% of them plan to use it again**, and only 5% said they don't intend to use it again in the future.

Colleagues the kit was lent to



Times the kit was used



The majority of teachers used the kit several times and recommended it to their colleagues.

Most teachers plan to use the debate kit again.

Kits were considered to be a good tool for teacher training

Interestingly three teachers specified that they had used the kits during **teacher training sessions**.

> *"I particularly like the format and the cards making it really easy to convince my trainees that they can run debates with their classes using this format."* – Teacher

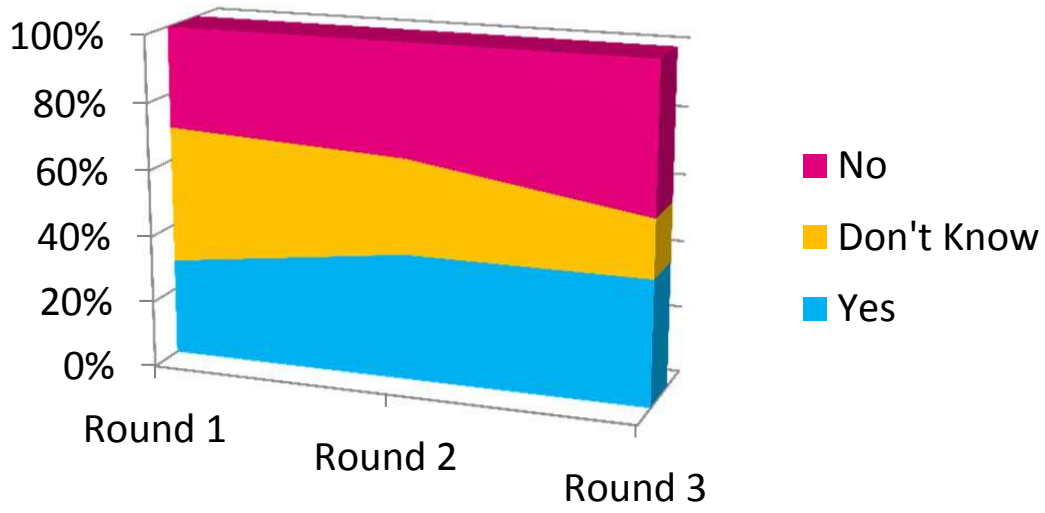
> *"Helps trainee teachers practice how they would run debates in their classes"* - Teacher

In the classroom, Electricity Distribution Debate kits were used in Years 9 and 10 (S2-S3 in Scotland), that is 13 to 15 year old students, and mainly during Physics and Science classes. However, some teachers also used them in Geography and Design and Technology classes, as well as in Electronics.

Usage of online resources and tools

We linked teachers to a page with references and additional information relating to it. We also uploaded on YouTube of introductory slides with audio explanations, to help teachers introduce the topic of electricity distribution (youtube.com/watch?v=1Z6p0D_G6JI) **The references page had a total of 997 unique page views, and the YouTube video was watched 113 times**.

We developed an **online tool to track how each class changes its views**. It is an online survey that teachers should fill at three different stages during the activity and it gives results at the end. **17 teachers used this new tool** to monitor how their students changed their views as they discussed the topic.



Teachers asked the students if they thought pylons should be built in Kinewell Valley, before starting the debate, half way in, and at the end of the activity. As the graph above shows**, the opinion of the students shifted from "I don't know" to either "YES" or "NO" answers**. There is no right or wrong answer, the only point of this survey is analysing whether the students change their minds throughout the debate, which they clearly do. This is extremely important, since it proves that **the students reflected on the issues surrounding electricity distribution during the debate.**

It should be noted that the students' opinion changes might be under-represented in these data, as only the overall opinion of the class was recorded, not the individual opinion changes of each particular student.

4. Aims and achievements

In the same feedback survey, we asked teachers if they agreed with certain outcomes of using the debate kit. We also asked them to rate the kit's content and design.

	Excellent	Pretty good	OK	Not great	Rubbish
Overall	54 %	46 %	0.0 %	0.0 %	0.0 %
Content	55 %	42 %	3 %	0.0 %	0.0 %
Design & format	63 %	32 %	5%	0.0 %	0.0 %

The kit received many positive comments and praise from the teachers:

> *"It persuaded my pupils to really think about the impact that Science is having on society!"* – Teacher

> *"Pupils loved it. They had a good understanding of viewpoints they would not have thought of on their own."* – Teacher

54% of teachers thought the kit is overall "excellent" and the remaining 46% thought it is "pretty good".

4.1 Specific outcomes related to Electricity Distribution

In the feedback survey, we asked the teachers to what extent they agree with a number of specific outcomes of using the Electricity Distribution Debate Kit.

Most (97%) of the teachers said that their students know more about the topic of Electricity Distribution, and 21% of them strongly agreed with this. All the teachers confirmed that their students are now aware of the differences between fossil fuels and renewable energies.

Up to **97% of the teachers stated that using the debate kit allowed their students to develop higher thinking skills around Electricity Distribution**, getting to understand complex concepts such as how the pattern of electricity generation is shifting from fossil fuels to renewable energies, or how electricity gets from the source to our houses.

95% of the teachers said that their students applied what they learnt during the activity to their daily lives, as they are now better at identifying how their daily habits can affect energy use and therefore, the environment. We think this is quite significant, given that it could result into a long term change in behaviour, which is probably one of the most difficult outcomes educational

97% of the teachers said that their students know more about the topic of Electricity Distribution.

95% of them said that students can apply what they've learnt during the activity to their daily lives.

resources can aim for.

Appendix 1: Evaluation methodology

All teachers who had requested an Electricity Distribution debate kit were sent the **email** below, to ask them if they had used the debate kit. The clicks on the YES and NO links were then tracked and counted.

> Last school year, we sent you an Electricity Distribution Debate Kit which I hope you received; and we've a question for you:
>
> **Did you use the Electricity Distribution Debate Kit?**
>
> YES NO
>
> We want to do more kits, to improve them, and to keep them free, so we need to get the evaluation right. You can help us by **clicking YES or NO** and if you also fill in the survey that would be brilliant!

Teachers who clicked on the NO link were taken to a survey asking them why they hadn't used the Electricity Distribution debate kit and inviting them to make any comments or suggestions. Teachers who clicked on the YES link were taken to an online survey about their use and opinion of the Electricity Distribution Debate Kit.

The **survey** mainly asked about the usage of the kits; the year group, and if the kits have been used more widely than just one debate with one class. Have the teachers lent the kit to any colleagues? How many times have they used the debate kit? What were the main outcomes of the kit of their students and for them as teachers?

Thank you for letting us know you used the Electricity Distribution Debate Kit, if you have a few more minutes, we'd really appreciate if you could answer this survey. It will help us measure what you and your students gained from the Electricity Distribution Debate Kit, and will help us make

future kits as useful for teachers as possible. Also, if you fill in the survey you will have the chance of **winning £50 M&S voucher**!

It will take less than 5 minutes. Don't feel you have to write lots, brief answers are fine.

1. How many times have you used the Electricity Distribution Debate Kit?

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5+

2. Do you intend to use the Electricity Distribution Debate Kit again, this academic year?

- ☐ Yes
- ☐ No
- ☐ Haven't decided

3. What year groups of students have you used the Debate Kit with? (Please tick all that apply)

- ☐ Year 7 (P7 in Scotland)
- ☐ Year 8 (S1 in Scotland)
- ☐ Year 9 (S2 in Scotland)
- ☐ Year 10 (S3 in Scotland)
- ☐ Year 11 (S4 in Scotland)
- ☐ Year 12 (S5 in Scotland)
- ☐ Year 13 (S6 in Scotland)
- ☐ Other (please specify) Please enter an 'other' value for this selection.

4. What subjects has the kit been used to teach? (please tick all that apply)

- ☐ Physics
- ☐ Design and Technology
- ☐ Geography
- ☐ Science
- ☐ General Studies
- ☐ Other (tell us what) Please enter an 'other' value for this selection.

5. How many teachers have you lent the Electricity Distribution Debate Kit to?

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5-10
- ☐ 11+

6. How would you rate the Debate Kit?

6. How would you rate the Debate Kit?	Excellent	Pretty good	OK	Not great	Rubbish
Overall	☐	☐	☐	☐	☐
Content	☐	☐	☐	☐	☐
Design & format	☐	☐	☐	☐	☐

7. To what extent do you agree with the following outcomes of using the Electricity Distribution Debate Kit?

7. To what extent do you agree with the following outcomes of using the Electricity Distribution Debate Kit?	Strongly agree	Agree	Disagree	Strongly disagree	Don't know
My students know more about the topic of Electricity Distribution	☐	☐	☐	☐	☐
My students are now aware of the differences between fossil fuels and renewable energies.	☐	☐	☐	☐	☐
My students understand now that the pattern of electricity generation is changing: from fossil fuels to	☐	☐	☐	☐	☐

7. To what extent do you agree with the following outcomes of using the Electricity Distribution Debate Kit?	Strongly agree	Agree	Disagree	Strongly disagree	Don't know
renewable energies					
My students understand now how electricity gets from the source to our houses	☐	☐	☐	☐	☐
My students are better at identifying how our habits can affect energy use and therefore, the environment	☐	☐	☐	☐	☐

8. The main outcomes from using the Debate Kit, for you as a teacher, were… (please tick all that apply)

- ☐ It offers a new teaching approach
- ☐ It improves team/ group work
- ☐ It promotes the engagement of all the students
- ☐ It introduces certain ethical and environmental issues
- ☐ It contains recent and up to date information
- ☐ It requires little preparation and planning time
- ☐ I am now more confident at running a debate.
- ☐ My students are better at seeing all sides of an issue and sharing them with the rest of the group.
- ☐ Other (please specify) Please enter an 'other' value for this selection. ☐

9. Do you have any comments on the *content* of the debate kit?

10. Is there anything else you would like to add, such as things you particularly liked or disliked about the Debate Kit, or what you would change about it?