Visual framing of emerging energy technologies: public accountability on the internet

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Abstract

In response to emerging energy technologies, 'internet detectives' may provide substantial insights that may hamper or help to accomplish a transition to renewable energy. Rather than attempting to educate these critical and opposing citizens, activists and NGO's; their framings – both in words and images - could be included in this energy transformation as an important form of public accountability. We build on the idea of an 'ocular democracy' in which these 'eyes of the people' are valued for their contribution to democratic decision making. We distinguish two interconnected elements of visual public accountability on the internet: the 'showing' and 'seeing and of visual evidence. 'Showing' is distributing information on the internet to convince others from a particular point of view. "Seeing" is visual information gathering and combining. This seeing is only visible on the internet and relevant for accountability when this information is shown and constructed and distributed to convince others of a particular point of view. All sorts of actors engage in these activities of public accountability.

Based on a visual and content analysis of a dataset created by use of search engines google and duck duck go – and by use of google image scraper, this exploratory study of visual framings about the controversial shale gas case, and the emerging technology of geothermal energy demonstrates that (1) giving account (showing evidence) by governing actors, including industry is most dominant in the search results (2) the emerging technology of geothermal energy (and risks) is predominantly visualized in photographs of geysers and industrial geothermal energy sites (3) shale gas (and risks) is predominantly visualized in infographics whereas the search term 'shale gas' leads most of all to maps and info graphs on the techniques; shale gas and risk as a search term leads to search results with info graphs visualizing the risks in the production process (4). Seeing of counter

evidence by 'internet detectives', including NGO's and some academic experts in visualizations is only dominant in the search results for shale gas and risk and danger - this demonstrates that the issue is more controversial. All the other search results show more dominant 'showing' of evidence by governing actors. Both governing actors and internet detectives most of all visualize 'facts', and suggest to provide technical information. Whereas governing actors provide evidence for the necessity of the energy sources; internet detectives seem to reveal unknown or repressed information to critically assess the normative and technical framings by governing actors. Further research is necessary to be able to know what the role of the visualizations and their framing by actors has been in the evolvement of a controversy. Especially the case of geothermal energy is interesting, as this is more in the early stages of an emerging technology.

Introduction

In an ocular democracy (Green 2010), citizens are considered *spectators* of democratic decision making. In their everyday experience, citizens *watch* democracy, rather than co-decide or co-govern – is one of the main arguments of Green. This means that in an ocular democracy, next to having a voice (a vote), what people get to see in mass media and social media plays an important role in democratic decision making. Green considers the public as a rather passive group and parts of this public as being excluded from democratic decision making. He argues that through their 'gaze' (on mass media) these otherwise excluded and passive groups could be empowered and included in democratic decision making. Candor (sincerity) of those in power is important. Green's ideas have been further criticized and developed. The public is not as homogenic as presupposed; candor has been proven not to be the main element that the public appreciates; and citizens are not as passive in a mediatized democracy as Green agues (REFS). Next to being spectators and being influenced by visuals of academics, politicians, internet-troll and others; citizens can also be considered detectives (Dijstelbloem, 2016). Internet detectives search the internet and other information sources that are more easily accessible through the internet. In addition, they distribute information to the public, but also accessible for governors, political leaders, business leaders and (other) NGO's. By doing so they engage in the enactment of *public accountability: holding those in power to account for their decisions and actions.*

We distinguish two elements of this ocular democracy that have influence on energy governance that aims for a transition to sustainable energy: *seeing* and *showing* evidence. On the one hand, for citizens to believe their governors, including governments, industries and all sorts of governing actors – they want to get 'ocular' proof. They need to be convinced of the rightness, justice of decisions on energy that relate to their surroundings based on *visual evidence that governing actors show*. On the other hand, citizens and others also produce images that can serve as evidence –

which they can use themselves to hold governing actors (including industries and others) accountable or that can be used by other actors for the same purpose. Such citizen generated data for holding governing actors to account is also an emerging strategy of many NGOs either because they do not trust government generated data, or because such data is not relevant for the issues citizens prioritize {Piovesan, 2017 #3294}. The internet detectives *see evidence* on the internet, and show it to all sorts of actors. As such, internet detectives not only need to be citizens

This 'seeing' and 'showing' goes hand in hand with a *visual dimension* that is increasingly influential both locally and globally through the rise of internet and social media. Engaged citizens', activists, governments, industry, and others successfully visually frame policy issues, and influence the problem definitions and governance of these issues, and as such play an important role in the way we understand these issues. In the energy transition, public perception and opinion play a vital role in order to decide on, and implement new energy sources (REFS; Devine-Wright; and others).

A complicating factor is that these 'eyes of the public' are hard to distinguish from the production of 'alternative facts[i]' and 'post-truth' of the opinion manipulating trolls on social media and internet[ii]. Even scholars in critical theory question if their post-truth and constructivist approaches are now held against them and the public they tried to emancipate (Latour, 2004[iii]; Epstein 2011[iv]). When everything is being framed, does the 'Truth' no longer matter?

Therefore, an urgent question – central in this paper- *is what the role visual framings of 'internet detectives' can play in enacting public accountability of key actors in the energy sector, and what is its influence is in a transitions to sustainable energy*?

In this paper we link this ability of the public to hold accountable through informal ways (reporting incidents, reporting counter-facts; naming and shaming, to name but a few strategies) to the increasing access of the internet and social media as tools for such account holding. We explore how visualisations in many forms – data visualisation but also artist impressions and artistic photography or stills - play a role in these informal accountability strategies of the public that more and more also take place through the internet and social media. We do so in two emerging technology cases, one which is controversial – hydraulic fracturing for shale gas; and one that may become controversial –geothermal energy. We conducted a visual frame analysis of visuals used by key actors (globally) on the internet.

In this paper, we will first elaborate the conceptual framework of showing and seeing in visualizations. Second, we will elaborate the methods used, and present the results of our visual frame analysis of geothermal energy and shale gas.

1. Showing and seeing: visualizations on energy

The role of the visual and how these are being used by public actors in a post truth age is often overlooked in the literature on energy transitions (for example Geels, and others). If at all, transitions theory considers critical or opposing citizens, NGO's and others as Not In My Back Yard activists (Wolsink), as actors that need to be included in deliberations (Stirling), or as contributors to niche-innovations in for example a new type of NGO's, the Social Movement Boundary Organizations' that organize or assist in bottom up energy initiatives (Hisschemoller and Sioziou 2013,p. 793).

Very often, the idea is that these citizens and NGO's need to be better educated perhaps through involvement in multi-stakeholder dialogues or technology assessment – or that through these processes their local expertise, experiences, or concerns can be taken into account in these transitions. This is the knowledge-deficit model in public understanding of Science (Williams, MacNaghten 2017), and the knowledge mediator (Turnhout, Halfman,2018).

There are three motivations in the literature on sustainable energy, and energy controversies, for including societal actors, their local expertise and concerns: (1) in order to improve democratic legitimation of decisions (2) improving the effectiveness of the measures through more buy in and compliance etc. (3) citizens as actors that can self-organize and start clean energy production themselves in for example energy cooperatives.

In this paper we focus on citizens in their role as citizens detectives. We are most of all interested in the question how to come to, and account for decisions of governing actors that are more inclusive, transparent, and legitimate by including the eye of the people. Actors part of a transition to sustainable energy, are subject to various formal accountability relationships, such as parliaments and shareholders and can be held to account with regard to specific laws and regulations, fiduciary responsibility etc. The ability of the public, citizens and citizens organised in civil society organizations, to hold decision-makers to account is however, considered of particular value from a democratic perspective {Steffek, 2010 #2670}.Internet detectives should not be considered as new governmental agents but as public actors. As spectators and detectives they contribute to an important form of public accountability on emerging energy technologies. Their information, their 'seeing' and responses to governing actors' 'showing' includes normative and practical judgments about what current and future energy sources are deemed viable, credible and legitimate; they can judge and hold account for the speed of transition. Internet detectives address issues left of the political agenda, and can for example, see and show social consequences of top down

measurements (such as subsidies, grants, taxes), or questions about what energy mix is preferred – and considered convincing.

In an ocular democracy there are two elements that have bearing on sustainable energy transitions: 'seeing' and 'showing' that are both important elements of accountability. Accountability is here used as a relational and communicative concept which means that it is defined as a relationship between someone who should be answerable for his/her actions (the actor) towards someone else (accountholder) (Bovens 2005){Bovens, 2014 #3295}. This ' someone else' is in democratic theory citizens who serve as principals for the agents in power and can in broader terms be referring to those with a legitimate stake {Bovens, 2014 #3295} . Public accountability is 'the opportunity of citizens to critically monitor and debate proceedings of political decision-making' which implies that decision makers are scrutinized, discussed and criticized in public (Steffek, 2010, p. 46). The object of accountability is in this context "matters of public concern" — such as energy production —which encompass, for example, spending of public funds and the actions of public institutions {Bovens, 2014 #3295},. Literature on public accountability mechanisms usually include three steps in account-giving; one actor who based on obligation shares information about his/her conduct often with explanations or justifications, a forum that can "question the adequacy of the explanation or the legitimacy of the conduct", and finally the passing of judgement of the actor's conduct by the forum {Bovens, 2014 #3295}. In our case this forum is the space that the internet and social media provides for the public to question and pass judgement on (public) actors. It is an informal accountability forum and the public is operating there without a formal invitation to participate in accountability mechanisms as discussed by Damgaard and Lewis {Damgaard, 2014 #3299}. Accountability to the public is claimed to be one of the defining features of the political system in democracies {Dubnick, 2014 #3257}. Central in an ocular democracy would be citizens who want their governors, including scientists, industries and all sorts of governing actors – to provide 'ocular' proof. They need to be convinced of the rightness, justice of decisions on energy that relate to their surroundings based on *seeing* evidence. On the other hand, citizens also produce evidence – they 'show' – they can use themselves to hold governing actors accountable or that can be used by other actors for the same purpose. This producing of evidence can be seen as one element of the empowerment of those affected to hold power-holders to account that is considered core to democratic accountability {Warren, 2014 #3261}. The ability to hold to account depends both on information and attentiveness, making the cost of accountability to increase with scale, distance and complexity and often involves mediation where e.g. watchdogs hold public actors to account on behalf of various constituencies {Warren, 2014 #3261}.

Research on the visual in accountability is still at a relatively early stage. Much - although not all, see Bekkers and Moody 2014 - accountability research has tended to focus on the use of visual forms to obscure accountability (Davison). Visual framing – for example producing photo-shopped images - is than considered a manner to highlight certain elements, and leave out others out in order to convince others of particular reality. Or as Gamson and Stuart in 1992 argued, visuals offer "a number of different condensing symbols that suggest the core frame" of the issue (1992: p. 60). Visuals condens a large amount of detail into a practical framework that is very relevant and appropriate to how people make sense of the everyday world. In accountability studies these framing processes – either in words or in visuals – are often considered rhetorical strategies to hide the truth – to obscure facts – or to present them in such ways to reveal other aspects of 'reality'. They are often opposed to rational decision making, and giving account. Framings, through images and metaphors are than considered distractions that we need to get rid of in order to come to rational decisions and smart policies (Fishkin 1995; Niemeyer). This is not only true in a post-truth era, it is widely recognized in studies of visual culture that images are inherently open to different interpretations (Mirzoeff 1999; Mitchell 2005; Sturken and Cartwright 2001; Mnookin 1998). Their representation of reality has been disputed for a long time - and it is widely acknowledge that trying to get to the meaning of a visualisation is always context-dependent, and that framing is part and parcel of producing images.

Still, even though we are aware of framing in visualizations and their limitations with regards of presenting reality; visuals produced by governing actors, and citizen's detectives, NGO's and others very often do (1) appeal to a representation of reality and facts. These visualizations are attempts to register, and record. They freeze people, objects and movements in time and place (Mirzoeff 1999). The visualizations also can (2) simplify complicated things in order to get across a clear message or signal. Visualization may help to make more transparent – more comprehension – the information – the evidence that is shown . As the expression goes: "a picture is worth a thousand words" (Hartley1992; Moody 2010). This quality of visualizations may be reinforced, but also obscured by the possibility that visuals have to (4) stir emotions, and to convince and persuade people. Simplification can help get across a message, or ocular 'evidence', It may also more easily stir emotions, and therefore be more persuasive[1]. Last but not least, when made sense of in groups (4)

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[1] Persuasiveness of images increases if they are combined with verbal or written text, or even with sounds (Marcum 2002).

visualisations may help create common ground. When talking about what is in a picture, "a common grammar" (Weick 1969) may be developed.

In the study of the role that visuals play in public accountability – we will not attempt to assign a degree of 'truth' – of a close representation of reality in the visuals. Rather, we will study how visualisations are being used and understood to give account and give evidence on energy controversies. This means, that we acknowledge that facts are also constructed and expressed by academics (and other actors) in all sorts of forms, for example linguistic statements, pictures, diagrams, models, maps and so on (Morgan, 2011: 7-8).

2. Research design and methods

This section first describes why the cases of shale gas and geothermal energy are interesting to study 'seeing' and 'showing' of evidence on the internet by all sorts of actors. Second, we will introduce the methods used to analyse the visual public accountability on the internet.

Case selection

Shale gas and geothermal energy are interesting, exemplary cases to explore the role of visualizations in the enactment of Public accountability. Worldwide, shale gas was first considered a promising new energy source, even a game changer (in the US). New techniques to extract this type of gas, made the US energy independent. Other countries started to explore their possible sources. However, it became a controversial energy source as it is fossil fuel with risks in its production process (Dodge and Mete 2017; Heikili 2017). In the Netherlands, for example, shale gas production became controversial within a year (2010-2011), after national exploration permits and one local permit in the community of Boxtel had been issued. The national government (ministry of Economic Affairs) together with experts from TNO (Dutch institute for applied science) and EBN (Energy company the Netherlandsv) considered shale gas an opportunity to add to the national gas supply. The local community of Boxtel first agreed and issued a zoning permit, but soon local resistance scaled up to national resistance. What had been framed as 'business as usual' became a risky business (Metze 2014/2017). Local communities, residents, but also environmental organizations and newly erected action groups protested against shale gas

exploration and many Dutch communities declared themselves 'shale gas free'. As a results, a national moratorium is still in place, at least until 2023. Other countries also put a moratorium, for example France. However, some – such as the UK – are stimulating shale gas explorations (Dodge and Metze 2017).

Worldwide, geothermal energy is considered a possible sustainable energy source, although there may be some risks in its production depending on the techniques being used (Dickson and Fanelli 2003[vi])). However, many governmental actors consider it a part of a transition to more sustainable energy. For example, in the Netherlands it is considered by national, provincial and local governments – and other actors, such as NGO's, energy experts and so on as a sustainable source to provide for our future warmth (Smink et al 2017). Geothermal energy and ultra-deep geothermal energy are part of the energy agreement – the national agreement – but also more specific agreements locally (Green Deal Brabant; Energie akkoord gelderland, for example). However, there are many uncertainties about geothermal energy production, especially about ultra-deep geothermal energy: is there enough potential to access the sources, what is the risks of earth tremors or earth quakes, is fracking involved, and what type of fracking, can electricity be produced from the ultra-deep production. There is even definitional confusion about what is geothermal energy, when it is deep and when ultra-deep (Rathenau Institute 2017).
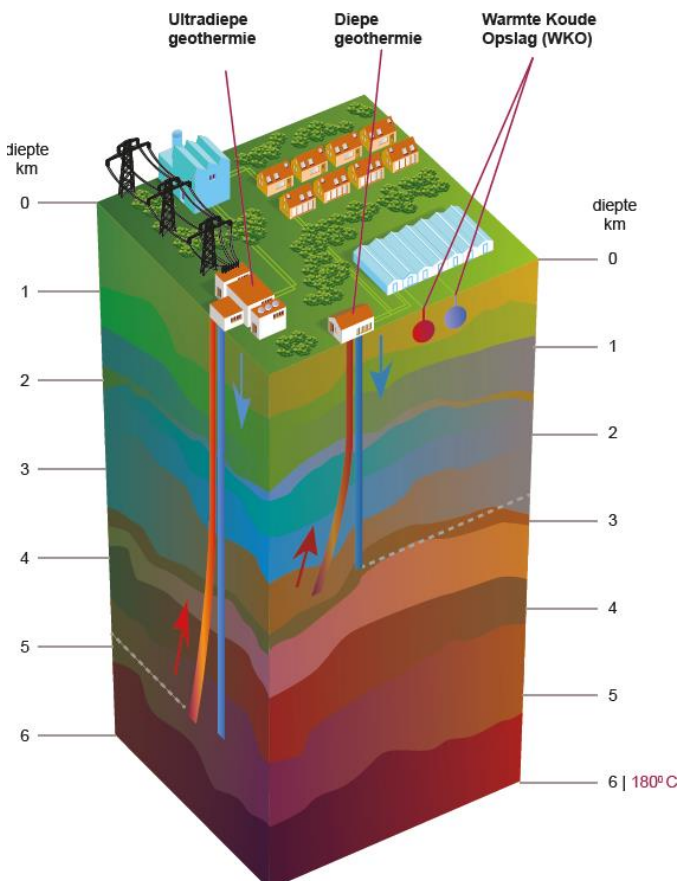
Figure 1: Ultra-deep and deep geothermal energy production (Source: Rathenau Instituut 2017)

Because of the many uncertainties, the emerging (technological) controversies – these two cases are interesting to study in an analysis of public accountability and the role of visualisations in them. The flames from the drinking water tap – is exemplary for how influential visualization can be – as a way of the public to hold industrial actors and governments accountable for their decisions to produce shale gas. In this section we present our preliminary results of our visual analysis- and attempts to categorize the visuals as condensation, referential, dominant, and as a particular type of public accountability: the showing by the accounters that give account; and seeing by the public that hold accountable.

Methods: data set and analysis

In order to answer our question about how visual framing enacts public accountability in relation to energy production technologies, we gathered and analysed the images in the following ways.

Data gathering

To construct a relevant dataset of "found images" in their digital context (on websites), we searched the internet in three different ways: (1) using google image search (spring 2018 and spring 2019), (2) using duckduckgo search (autumn 2018 and spring 2019), (3) using google image scraper (spring 2019) to scrape specific url's (websites of relevant actors in the Netherlands involved in the shale gas and geothermal energy cases).

We started with a Google image search using key words because Google is the most common used search engine which aims at coming up with accurate and relevant search results, Using the Google search engine to create a dataset comes with many limitations. Google image search is portraying the images based on (1) search term in the image label, including language (2) location of the search (3) previous searchers (we erased our search history), (4) language (5) profile (we searched anonymous) (6) time of the search (see for example Diaz 2008). Google is rather secretive about how they organize the search results and won't disclose the exact parameters and algorithms. Most probably is that information from the links and the images itself is used: matching names in images-captions are the first results. The ranking of the images (what is the first most relevant) is also based on 'popularity' – how often they have been clicked on (link analysis, page rank, and hits algorithms - see Langville and Meyer 2012). May be also paying customers may pop up in the search results. Although usually google indicates if there is advertisement in the search results (see on the goggles

of google: Diaz 2008, and more recently Langville and Meyer 2012). Hence, the database created at least represents a set of search results that would pop up when searching as a general interested person in the Netherlands in the English language – and with use of these key words. In order to check, if the search results are very biased, we verified these results with a different search engine: DuckDuckGo (no region indicated, private search, no history, no cookies) in autumn 2018. Again we performed the same search, with search keys. Again, earth warmth turned out with no relevant results. The visualizations displayed as the first ten in this search were not completely the same – However, they resembled the search results from google to such a large extend that for now we have not included them in the dataset.

We used the google and duckduckgo search engine and in rather similar ways. For the shale gas case we searched for: shale gas, hydraulic fracturing and fracking. Hopke and Simis (2017) showed in a study on the use of hashtags in the shale gas controversy that #fracking is used most often by adversaries of the technology, #shalegas is most often used with a positive connotation, and their study did not include #hydraulic fracturing – but we included HF as a search term it as we were expecting rather neutral or technical connotations. For the geothermal energy case, we searched with geothermal energy, deep geothermal energy and earth warmth. The results for earth warmth were irrelevant – as these were images of temperatures in the earth and illustrations of what parts of the world are hottest. We excluded those.

For each of these energy search terms, we used them in specific combinations: 'risks', opportunity, and 'protest'. We included 'risk' as we were expecting most of all visual *public* accountability about risks of the technologies. We also checked for use of 'protest' and 'danger' in combination with the energy technologies (spring 2018 and 2019). However, search results danger were very similar to 'risks'; and for protest only visualizations of marches against the energy technologies were the search results.

	risk	opportunity	protest	danger
shale gas				
fracking				
geothermal energy				

deep geothermal energy				

We used the first fifteen images of each search results. In total we have 2 (search terms) x 2 (risk) x first fifteen images = 60 images. This google search data set was completed by adding information about the caption of the image, the URL name, the actor, the web source, and the main message on the webpage were we found the image.

In the next step coding of the images and their actor was conducted in three steps:

1. We defined the type of image (photopgraph; clearly photoshopped photograph; data-visualization; info-graphic; map; cartoon, giff; video.

2. We defined what *type* of actor is the user of the image, i.e. the creator of the webpage.

3. We determined if the actor was attempting to convey factual information with the image on the website – or that a normative message about the energy sources was being conveyed. The caption and the title of the webpage were used to determine this.

4. In the last step we also coded for public accountability in the form of 'showing' or 'seeing'. Showing: Industry and governments giving evidence to account for governing of shale gas and geothermal energy. Seeing: NGO's and others giving evidence of potential risks, uncertainties and other caveats in the governance of these energy sources.

   To code the images in their context possibly leads to biased coding. Therefore, we have applied coding-in action sessions to establish better coding categories, and higher inter coder reliability (in a qualitative way, so far – creating codes that the coders agreed on and applied in the same ways to the visuals).

3. Results: seeing and showing about geothermal energy and shale gas

The results of the analysis in the exploratory study are presented in this section. We will first present the results per search, and then draw conclusions.

Seeing and showing geothermal energy

The search results for 'geothermal energy' in google show that the first fifteen visualizations most of all depict (semi) industrial sites of geothermal energy (see figure 2). In addition, 6 infographics are found. The content analysis reveals that these visualizations are put on the internet by 6 businesses in geothermal energy; 3 governmental actors; 2 academic actors; and 4 knowledge actors (non-academic/wikipedia). In addition, the analysis of the caption of the images –and the webpage – demonstrates that ten visualizations were accompanied with a normative message – in this case all except 1 – which is the citizen detective – seeing - with a positive sentiment.
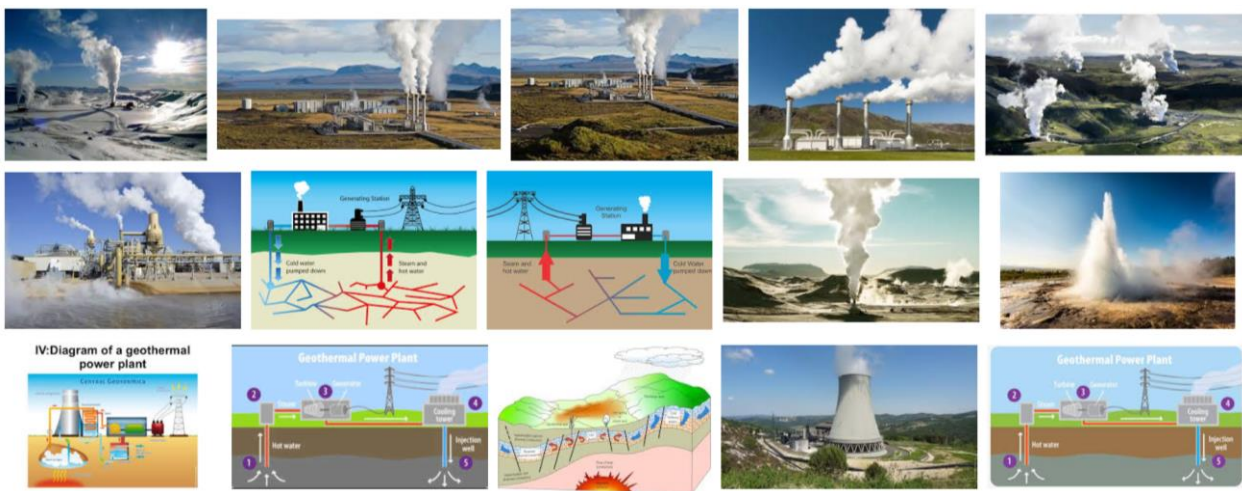

Figure 2: First 15 search results for geothermal energy (google search).

The results for the search for geothermal energy and risks, show a very different search result. Seven of the visualisations are data-visualizations. There are four infographics and only two photographs – and one power point slide with the risks of geothermal energy production. The analysis of the actors, the content of the captions and the websites shows that three governmental actors' visualizations pop-up first in the search results; five businesses; three governmental actors; two academic (papers); 1 media-actor; 1 activist group; and two boundary groups of which one is leaning towards 'advancement' of geothermal energy; and the other is a consultancy agency that supports business and governmental actors with their energy policies – and helping them to address climate change (climatepolicyinitiative.org). The images of this consultancy agency pop up twice in the search (this raised the question if they are paying google?). The visuals are used most of all – again – to show evidence by governing actors and business that are positive about geothermal energy and its risks. There are three negative visualisations – and websites – of which one is by

activists (peak oil), and one is by a business (in housing); and one is by a governmental actor which presents a study into possible earthquakes.
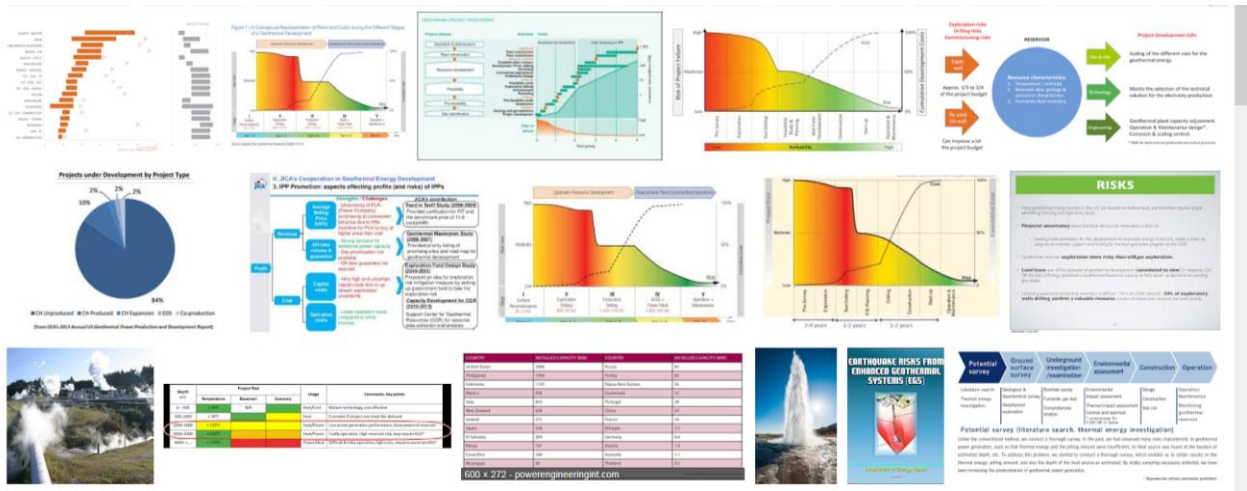

Figure 3: First 15 results (delete last three) for geothermal energy and risk (google search 10-10-2018)

Visualisation of this emerging possible sustainable energy of geothermal energy is most of all based on attempts to present reality. We have not come across very stylistic, photo-shopped visualizations. Four out of the nine geothermal industrial sites – do look rather natural – but the other five do depict industrial activities (without romanticising them – by for example depicting a working class hero). What is striking that there are most of all optimistic framings that pop up in the search – even when searching for risks. The internet detectives – their NGO's and experts are in a minority in the search results.

Seeing and showing shale gas (and risks)

The search results for 'shale gas' (see figure 4) first of all show a mixture of three maps and ten infographics explaining the techniques. There is one 'manipulated' direction-sign of shale gas; and there is one 'manipulated' warning sign popping up in the search results of this rather neutral term. Eight of the search results, are posts by academic-experts; four are by knowledge-actors (other than academics, for example Wikipedia); two are from business (among which Gazprom that uses the direction-sign of shale gas); and one is science X (or phys.org) - the warning sign – they present academic news "as if". Three of the eight academics have a positive sentiment with their visualization (including the consortium with businesses). Five are neutral. Three images are

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accompanied with negative sentiments, including the Gazprom website. They are negative as gas prices are dropping, and revenues are no longer as high as expected.
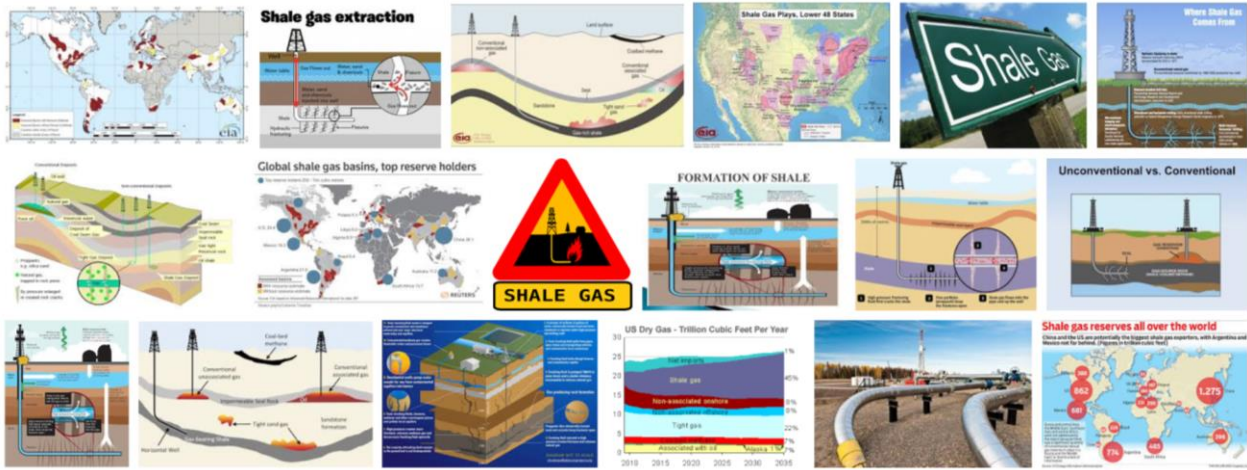

Figure 4: First fifteen (delete last three) search results for 'shale gas' (google search 10-10-2018)

The search results for shale gas plus risk are presented in figure 5 below. There are no maps present and the nine infographics are in a majority. There are four flow charts and one table. Again, these visualizations most of all depict facts but with a message – as infographs most of all do (REF). There are nine images from academic experts (2,4, 6,9, 10, 11, 12, 14, 15); two images from the same citizens' groups (the first one and the 13th) and one NGO – friends of the earth (the fifth visualizations in black and red). There is one business; and there are two media-source.   There are four images presented in a context with negative sentiments toward fracking; Five are neutral and six are positive (in the sense that risks can be mitigated or prevented), there are five academics in this positive framing. Three academics are neutral and one is negative. The citizen group and the NGO both are negative. The media is neutral and the business is neutral.
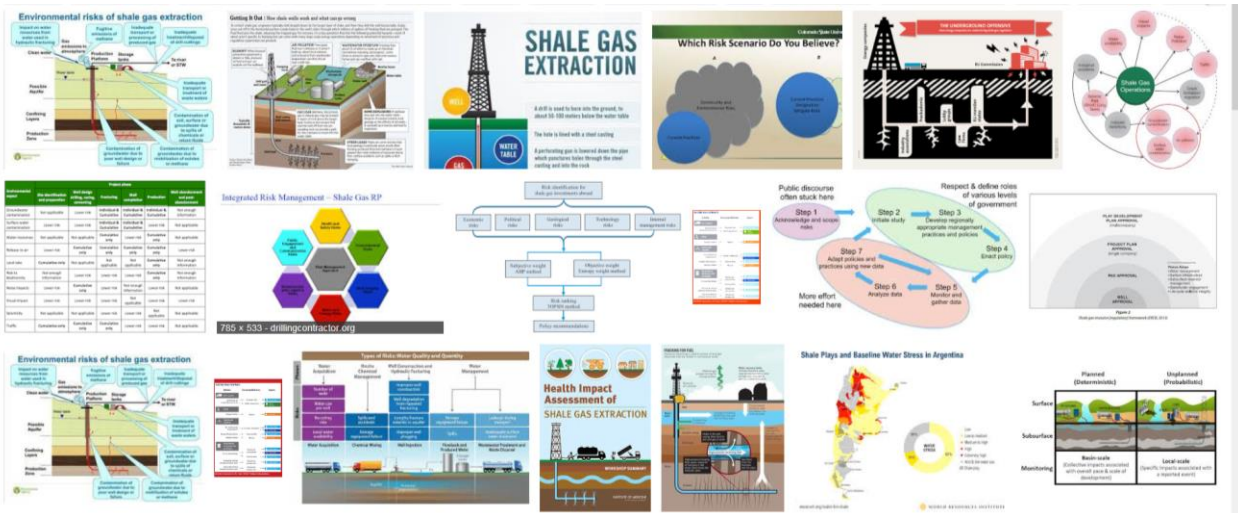
Figure 5: First fifteen search results (ignore last four) for shale gas and risks (google search 10-10-2018)

4. Discussion and conclusion: emerging technologies and visual accountability on the internet

Google goggles favour the *showing* of evidence by governing and industrial actors in their search results, although the first 15 visual results also did include some NGO's and other actors visualizations but these were clearly in the minority. In addition, academic experts and media were sometime 'showing' and supporting or reporting the evidence presented by governing actors – but in the cases with risks: they also were "seeing" and providing counter-evidence.

The results of our exploratory visual analysis of the emerging technologies of fracking for shale gas production, and (ultra-deep) geothermal energy in google and verified in duckduckgo searches, demonstrates that

(1) showing by governing actors, including industry is most dominant in the search results

(2) the emerging technology of geothermal energy (and risks) is predominantly visualized in photographs of geysers and industrial geothermal energy sites

(3) shale gas (and risks) is predominantly visualized in infographics whereas the search term 'shale gas' leads most of all to maps and infographs on the techniques; shale gas and risk as a search term leads to search results with infographs visualizing the risks in the production process

(4). Seeing by 'internet detectives' (sometimes including academic experts) in visualizations is only dominant in the search results for shale gas and risk- this demonstrates that the issue is more controversial.

(5) All the other search results show more dominant 'showing' of evidence by governing actors.

(6) Both governing actors and internet detectives most of all visualize 'facts', and suggest to provide technical information. Whereas governing actors provide evidence for the necessity of the energy sources; internet detectives seem to reveal unknown or repressed information to critically assess the normative and technical framings by governing actors. Further research is necessary to be able to know what the role of the visualizations and their framing by actors has been in the evolvement of a controversy. Especially the case of geothermal energy is interesting, as this is more in the early stages of an emerging technology.

What do the results tell us? We can draw conclusions about (1) google as a search engine; and (2) conclusions about what people click on – as these are the results presented in google searches! Hence, we can concluded what information people most of all receive when looking on the internet with google. Last but not least, we can draw some modest conclusions about (3) how the seeing of the public / and accountability is either not done very much – or not well represented in the google search results. We need to adjust and add other search techniques in our construction of a dataset to find the public accountability, for example, we need to also study of different platforms, for example twitter (as is known from the literature that opposing groups make use of twitter).

However, within these limitations, we can also draw some conclusions about (public) accountability:

-   Evidence giving by governing actors (showing to the public) is done in the shale gas case by use of images that display technical information, infographs, maps, and so on – but in the case of geothemal energy images are being used display natural looking production sites – that resemble the geysers.

-   The 'seeing' by citizens detectives – critical eyes – is most of done to warn for risks in energy controversies (also for renewables) – also almost all referential with use of maps and infographics – some images contain more people and protest banners, and there are some images of spills among the first top fifteen (is that true?))

Most visual framing of shale gas, fracking and hydraulic fracking seems to be giving neutral information or attempt to represent some form of reality (as is done in photographs); however, upon a closer look of the images, especially when accompanied with an analysis of their caption, the information in the link to the website, and on the website - there are choices both in the visualization as well as in the words that reflect normative choices, and preferences.

The risk of too high expectations with regard to the value of candor/transparency and showing - is that it raises a 'politics of passivity' on the shield. Transparency becomes the most important quality of governance and management, citizens can only approve or reject. What is lost in this way is that citizens can be associated in different ways: as an individual, as a group, about an issue. These forms involve different forms of interaction and also of visual interaction. If candor, however, becomes the only remaining value, that interaction is not enough. Citizens can then appear theatrical as an aesthetic phenomenon, it can look, but participating is a bridge too far. Urbinati therefore judges that in Green's analysis the people become an inspector who only watches, but is not allowed to participate and therefore never really can win the political battle and enact public accountability beyond symbolic non-influential forms. That position is only reserved for a few. The eye of the people also stares blindly at leaders. It has much less attention for the actual policy and has no means to suggest alternatives: it only approves or rejects the decisions and actions of the powerful. And as a public, the people can never really connect with the state or generate a res publica: the people remain outside the institutions of the state. At the same time, the association does not lead to a strengthening of civil society in a notion such as 'the people'. The idea of private initiative, cooperation and organization is lacking for this. The people take on a role of spectator at the fringes of the formal accountability forums, but the institutions remain behind a closed door.

In order to appreciate the interactive part of visual politics and ocular democracy and the way travelling images generate various sorts of publics with various forms of interaction and various relations to state policies, we suggest ocular democracy should be understood not only in an agonistic way aimed at enforcing candor but in an emerging way as well as it emphasizes the manifold ways in which public concerns with the acts of those in power may appear or disappear and public interaction is enabled.

Travelling images are not to be considered as just a new visual domain of politics or contestation in the realm of knowledge politics. Travelling images are part of a particular form of movement, of framing in which issues, publics, facts, uncertainties and visual representations shape a form of ocular democracy in which notions of accountability become defined.

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