Energy Grid North

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Created on: June 16, 2021 1:14 PM
Changed on: June 16, 2021 2:08 PM

Impact on society

What impact is expected from your technology?

What is the challenge at hand? What problem (what 'pain') does this technology want to solve?

The problem is that Energy companies need an improved way to check on energy within regions within the Netherlands.
The challenge at hand is that energy data needs to be collected and visualized in a clear and concise manner for multiple different stakeholders.
On top of this the application needs to be able to visualize a prediction of the incoming energy from different sources.

Can you indicate why you are sure that this technology is solving the right problem?

The application serves to answer the problems addressed above. We are sure since we have discussed the problems with the PO in terms of the needs of the project and what it needs to do.

How is this technology going to solve the problem?

One of the problems is ambiguity in representation of energy data. Our application serves the correct data to the user in order to make their energy insights more clear based on what they need. This solves the uncertainty and unpredictability aspect of energy production.
On top of that we offer simulations that can increase knowledge on power generations if one would want to buy them for the future.

What negative effects do you expect from this technology?

One of the negative effects that could happen is that the user might rely too strongly on the historical energy data provided by us. It's more of a guideline than real-time data so the user could interpret it wrongly.

In what way is this technology contributing to a world you want to live in?

Our application contributes to clarity among the production/consumption of energy. For the prosumer it provides numbers presented in a clear way, along with user tailored energy consumption prediction to which they can adjust their energy consumption to.
Energy companies should be able to make more accurate predictions towards energy consumption with the prediction tool which should lead to less energy failures in the country, better usage of energy etc.
So yes the values that the tool brings to use does comply with our own values in the world we want to live in.

Now that you have thought hard about the impact of this technology on society, what improvements would you like to make? List them below.

The tool makes it easier to digitalize the data coming in from all energy sources and displaying them in a concrete and concise manner which benefits the energy companies to make better decisions regarding balancing the energy net.
We can improve the technology by using better data provided by the energy companies and have a good data policy on what should be done with the data received.

Hateful and criminal actors

What can bad actors do with your technology?

In which way can this technology be used to break the law or avoid the consequences of breaking the law?

Not directly, but if a hacker can access our system. He/she will have the chance to manipulate the energy market.

Can you imagine this technology being used to cross personal - or societal boundaries?

The energy market is the only part in which people can be interested in hacking. With this you can find a lot of information

Can this technology be used against certain (ethnic) groups or (social) classes?

The hacker can impersonate other regions. This allows the hacker to manipulate the flow and exclude certain regions.

In which way can bad actors use this technology to pit certain groups against each other? These groups can be, but are not constrained to, ethnic, social, political or religious groups.

It will not be directly. But as mentioned before the hacker can manipulate the flow and exclude certain regions.

How could bad actors use this technology to subvert or attack the truth?

By manipulating the values that are used for transactions and messaging between the services.

Now that you have thought hard about how bad actors can impact this technology, what improvements would you like to make? List them below.

By using token based http requests we want to ensure that every request needs a token. We will use this to check whether the person is entitled to make the request. We also want to make sure that the messages that go through RabbitMQ contain encrypted data.

Privacy

Are you considering the privacy & personal data of the users of your technology?

Does this technology register personal data? If yes, what personal data?

No

Do you think this technology invades someone's privacy? If yes, in what way?

No

Do you think this technology is compliant with prevailing privacy and data protection law and can you indicate why?

Yes, we comply with the GDPR.

Does this technology mitigate privacy and data protection risks/ concerns (privacy by design). Please indicate how.

No.

In which way can you imagine a future impact of the collection of personal data?

We will not collect personal data, not now, and not in the future.

Now that you have thought hard about privacy and data protection, what improvements would you like to make? List them below.

There currently does not need to be any improvements. If we do decide to collect data in the future we will make sure to follow the GDPR compliances and secure the data, as well as not sell it to any third parties that are possibly interested in the data.

Human values

How does the technology affect your human values?

How does your technology affect the identity of users?

Our technology affects the real world and would, in a perfect world, use real-time data which are just numbers taken from every day life. It does not impose a world view, just a realistic one.
Users using this tool would be glad to have this tool as it provides them support for their job.

How does the technology influence the users' autonomy?

The tool allows users to support their arguments in making choices regarding the energy balance of the net. The decisions however are entirely up to the users but they should be aware of the sources that use to present the data.

What is the effect of the technology on the health and/or well-being of users?

Effects of extreme use would be growing too reliant on the tool without considering other sources of data and making badly supported arguments for the end decision.

Now that you have thought hard about the impact of your technology on human values, what improvements would you like to make? List them below.

Options for better data source and perhaps warnings or more text to explain the data shown so that users can make the most informed decisions.

Stakeholders

Have you considered all stakeholders?

Who are the main users/targetgroups/stakeholders for this technology?

Name of the stakeholder
Energy Grid Maintenance

How is this stakeholder affected?
These people will take care of the actual grid by preforming maintenance, replacing cables that are broken, connecting new homes to the grid, etc.

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Energy Supply Companies

How is this stakeholder affected?
These companies will supply energy to the grid

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Private Home - Energy Prosumers

How is this stakeholder affected?
These are the consumers that use up the electricity in their homes, pay the bills and provide any extra energy from their private solar panels

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Did you consider all stakeholders, even the ones that might not be a user or target group, but still might be of interest?

Name of the stakeholder
PO

How is this stakeholder affected?
Orchestrates the project

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Now that you have thought hard about all stakeholders, what improvements would you like to make? List them below.

The only improvement would be a technical improvement in the deployment part where the application is fully functional in the cloud provider. The individual components already work together locally and inside a docker container, just not the final step on the cloud.

Data

Is data in your technology properly used?

Are you familiar with the fundamental shortcomings and pitfalls of data and do you take this sufficiently into account in your technology?

Yes, we're familiar with the possibilities that malicious users misuse the data. Considering the fact that we don't store a lot of data it's difficult for any user to maliciously use it. Also our structure for the services is as such that the data is only used in certain secure locations.

How does the technology organize continuous improvement when it comes to the use of data?

CI/CD Pipelines are in place to make sure that any changes to how the data is handled and stored are done correctly. Tests within our microservices can determine if this is done correctly and will give us a better indication if something goes wrong. This leads to faster fixes incase there are data breaches or anything similar. We are also able to turn off certain parts of the application if we do want to prevent any data that's being used to become available for any type of user.

How will the technology keep the insights that it identifies with data sustainable over time?

Any data that is from the past can be collected from external APIs, none of this is saved in our application.

In what way do you consider the fact that data is collected from the users?

Any data that is corrected from users will not be sold or made available to third parties. It's handled internally and complies to GDPR.

Now that you have thought hard about the impact of data on this technology, what improvements would you like to make? List them below.

There are currently no plans to change the handeling of data in our technology.

Inclusivity

Is your technology fair for everyone?

Will everyone have access to this technology?

Only authorized persons from the Northern region may have access to our system.

Does this technology have a built-in bias?

Not on a personal level because we use standard texts and design. Yes on a technical level, because we assume that the users know what the functions do.

Does this technology make automatic decisions and how do you account for them?

Only when accounts are created. We set the roles default on "default"

Is everyone benefitting from this technology or only a a small group? Do you see this as a problem? Why/why not?

Every user can take advantage of the system

Does the team that creates the technology represent the diversity of our society?

Yes we take everyone into account

Now that you have thought hard about the inclusivity of this technology, what improvements would you like to make? List them below.

It can be handy to include some instructions on our dashboard.

Transparency

Are you transparent about how your technology works?

How is it explained to the users about how a technology works and how the business model works?

There are some fields that will show the connection with others.

If this technology makes an (algorithmic) decision, how is it explained to the users how the decision was reached?

The user can see the input fields. The input fields contain labels with informing terms.

Is it possible to file a complaint or ask questions/get answers about this technology?

Not via our system. But we are happy to answer questions.

Is the technology (company) clear about possible negative consequences or shortcomings of this technology?

We know which APIs can fall short due to limitations.

Now that you have thought hard about the transparency of this technology, what improvements would you like to make? List them below.

We can improve our dashboard by adding explaining texts.

Sustainability

Is your technology environmentally sustainable?

In what way is the direct and indirect energy use of this technology taken into account?

One of our goals is to improve the efficiency in which companies are able to predict and balance the energy net of the Netherlands.

Do you think alternative materials could have been considered in this technology?

No

Do you think the lifespan of this technology is realistic?

Yes, since we use a micro-service architecture. This makes the project highly configurable and ready for any changes in the future as well as scalability.

What is the hidden impact of this technology in the whole chain?

Wrong usage of our statistics and information provided by us could impact a decision that could not be feasible in a company.

Now that you have thought hard about the sustainability of this technology, what improvements would you like to make? List them below.

In order to promote changes and additions we could improve the way our application deploys and needs to wait on certain amount of containers before it truly is online. This way the application could spin up faster and be ready for more deployments.

Future

Did you consider future impact?

What could possibly happen with this technology in the future?

- Someone could possibly leak or crack the DB and leak information to bad actors.
- Technology or architecture could be outdated as newer concepts of software are being introduced.
- Cloud service could simply stop hosting.

Sketch a or some future scenario (s) (20-50 years up front) with the help of storytelling. Start with at least one utopian scenario.

Using our tool the energy grid is almost perfectly in balance as small additions of AI microservices were introduced and were perfectly able to scale according to the data provided by the tool. The Netherlands saves a lot of costs in extra energy supplied in the olden times as it now perfectly matches demand. Using the simulations, the energy companies knew exactly how many and where the optimal places where to build green energy tools and optimize the placement of energy producers.

Sketch a or some future scenario (s) (20-50 years up front) with the help of storytelling. Start with at least one dystopian scenario.

A lot of bad decisions were made using the new tool which cost the Netherlands a lot of money and leaves the energy grid down most of the time. Hackers are able to crack the credentials and leak the data every other week.

Would you like to live in one of this scenario's? Why? Why not?

The utopian one of course since it is a perfect world in which everything is now balanced in terms of energy and leaves the Netherlands with more wealth for other things to improve.

What happens if your technology (which you have thought of as ethically well-considered) is bought or taken over by another party?

We were already prepared on handing this technology over. The only thing that would have to change is that we would need to write better documentation in order for other developers to use it more quickly.

Impact Improvement: Now that you have thought hard about the future impact of your technology, what improvements would you like to make? List them below.

As stated above, better documentation. In order to come to the utopian society, we would need direct communication with energy companies and their data in order to realize the ideas there.