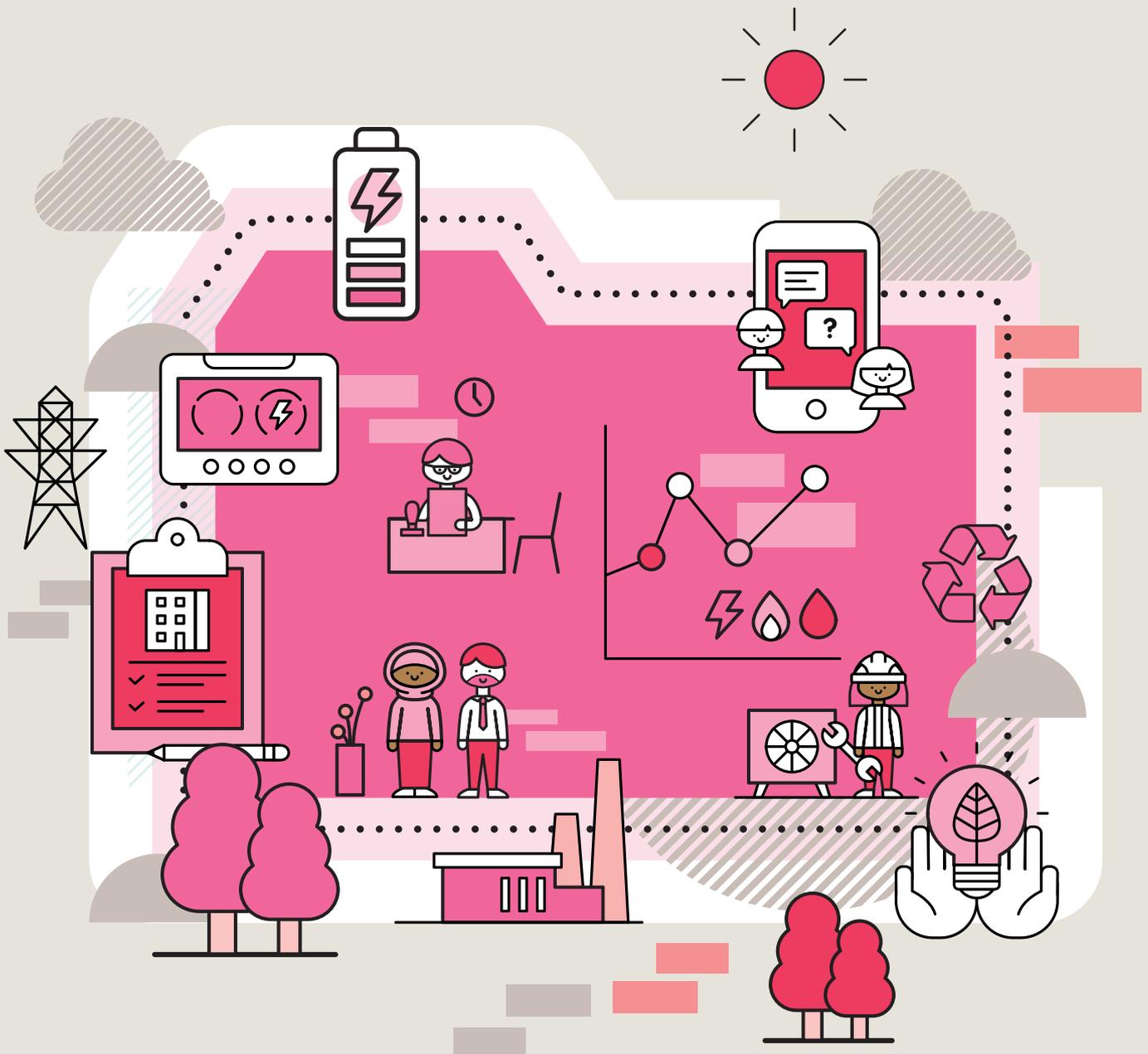


How to help businesses engage with DSR through Energy Management

Shenay Kinyok



Understanding what non-domestic consumers require from DSR

Introduction

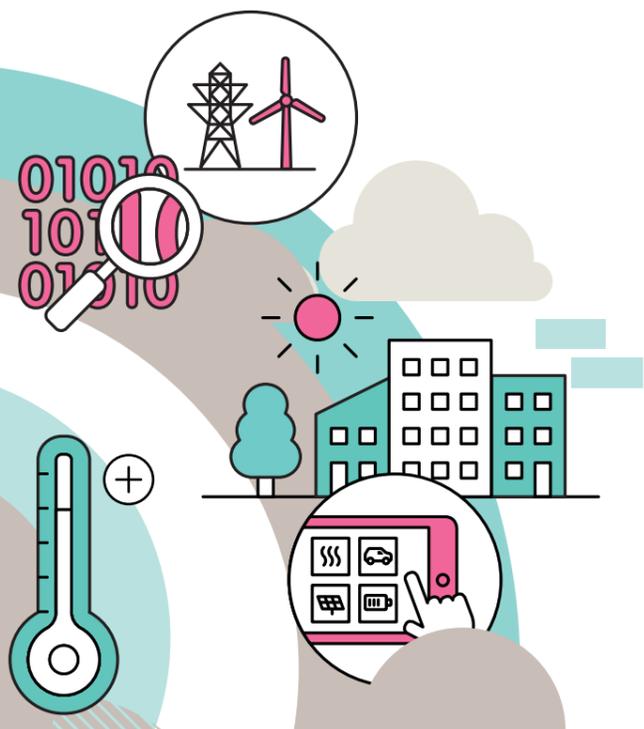
The energy transition is upon us, with many governments now committed to achieving net zero carbon emissions by 2050. To reach these goals we need to be able to make the most out of renewable energy by balancing supply with demand. Smart technologies can automate this balancing by increasing demand when supplies are high or reducing it when supplies are low. This practice is called Demand Side Response (DSR).

Non-domestic consumers will need to play their role in helping cut their emissions. However, their number one priority is their core business. They may be interested in reducing energy and want to save carbon to do their bit, but this will only ever be a secondary priority.

UK & Canadian Governments have funded the Energy-IQ project to understand how to help businesses manage their energy and reduce their emissions together with DSR.

Energy Systems Catapult set out to understand what non-domestic consumers need to better manage their energy. To do this, we worked with Q Energy, a digital energy services company who have a platform that aims to deliver energy, cost and carbon savings.

We report our findings in three insight papers: the first paper identifies user needs; the second looks at what a solution requires to meet these needs; and the third paper focuses on DSR, highlighting some key barriers and how to overcome them.



The Energy – IQ project

We spoke to several organizations in the UK and Canada (Ontario and Alberta) to understand their energy management needs. We included large commercial property owners, municipalities (local councils) and Small or Medium-sized Enterprises (SMEs).

Within each organisation we spoke to people who were responsible for energy management. We found that engagement in energy management varied depending on the role and responsibilities of the participant.

Participants included:

- Customer Operations Managers, who work within large commercial properties to ensure their buildings are operating efficiently for their customers.
- Energy Managers, who are solely dedicated to managing their buildings' energy and operations. They typically manage several buildings.
- Small Business owners (SMEs), who have no dedicated Energy Manager and so manage all their business needs themselves.

In this paper we refer to these participants collectively as Energy Managers (EMs).

DSR could be key to tackling carbon emissions, but businesses will not accept it if they don't understand what it is, how it will benefit them or the possible risks to their business.

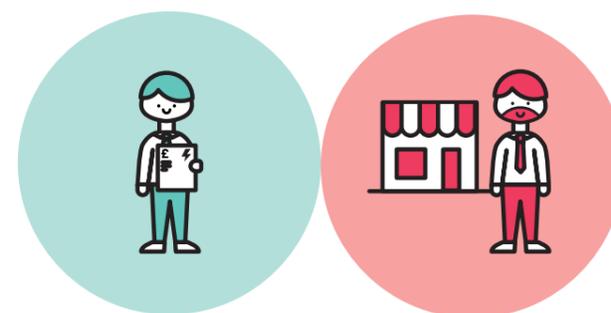
This paper looks at how Energy Managers' understanding of DSR can influence uptake and engagement in DSR services, by testing the proposition of an energy management system that would allow DSR. Here we highlight some of the barriers to engagement and what an energy management service needs to do to help make a proposition acceptable.

Perceptions of Energy and DSR

People have different understandings of energy and DSR –Speaking to a range of EMs, we found that participants varied in their understanding of energy and flexibility.

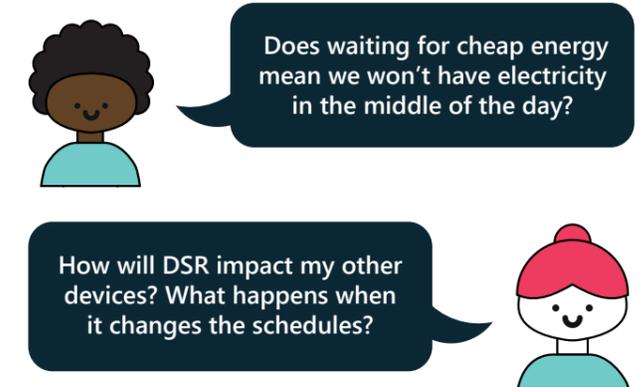


Dedicated energy managers typically have a very good understanding of energy. They know the fundamentals of energy such as meeting supply and demand, pressures experienced by the grid and the unpredictability of renewable energy. They are also familiar with the concept of DSR, mostly due to their role and experience in managing energy. This understanding is required in order to do their job as they are responsible for finding ways to improve energy management and energy efficiency.



Customer operations managers and SMEs, on the other hand, vary more in their level of understanding of energy and DSR. Whilst some did have a very good understanding of the fundamentals of energy, others knew less about the challenges of meeting demand with supply. They were not familiar with DSR and in some cases found it difficult to understand, largely due to having less experience with energy than dedicated EMs. They had many questions about how DSR would work, which tended to focus on how it would happen within their business. In some cases, misunderstanding led to concerns that there might be times when they wouldn't have power for things they needed.

These questions and concerns reflect their different priorities and responsibilities that are not related to energy management, such as providing a good service to their building's tenants and running their business.



Initial questions around DSR - A less developed understanding of DSR Vs more a developed understanding of DSR.

Introducing DSR

People need a basic understanding of DSR to be reassured that they won't be left without electricity when they need it.

EMs have different levels of understanding of energy mostly due to their exposure and experience with energy and energy management in a commercial setting. Don't assume they will all immediately understand DSR.

When introducing DSR services it is important to emphasise that the service is designed to learn about a business's electricity use and tailor DSR delivery based on that, so that it doesn't disrupt the things electricity is used for.

Building an understanding of DSR

Many EM's concerns over DSR were due to a lack of understanding and trust.

The three main questions EMs had were:

How does DSR work?

How does DSR work, do I just press a button? Is it a setting?....Does waiting for cheap energy mean that EV chargers won't work?



What impact will it have?

I don't want to change temperatures and impact thermal comfort, as this can lead to lots of complaints from staff or customers.



How feasible is it?

How much demand shifting is possible when a building is fully occupied? You can't tell people to not use energy in the middle of the day.



To avoid these types of concerns you should:

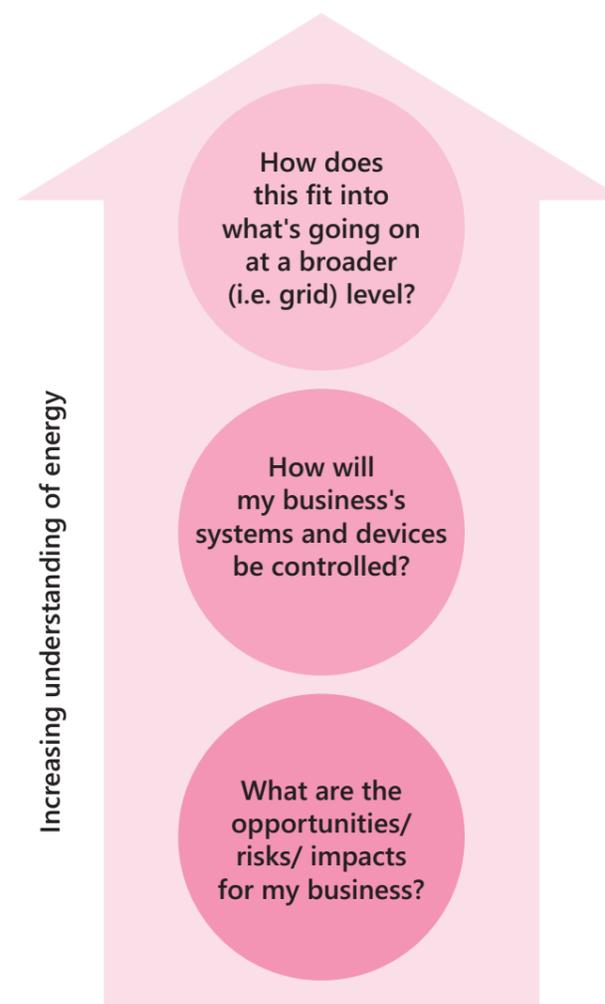
Provide a clear definition

A DSR service could be part of an energy management tool. The digital service company who provide the energy tool can also provide software services to help manage DSR for their customers.

But for EMs to consider DSR services, they need to understand how it might impact the things they use energy for (e.g. keeping customers warm or food cool). Generic definitions of DSR that do not explain this will leave EMs uncertain about whether a service is compatible with their business.

Tailoring descriptions of DSR to a business's systems and devices will help EMs understand the opportunities (e.g. energy- or money-saving) and risks (e.g. potential for negative impact) and make an informed decision about whether the service is suitable for them.

Keep in mind, though, that there are different types of EMs. They will all want to understand the impact on their business before committing, but depending on their role and responsibilities and their engagement with energy, some may want further information, such as exactly how DSR will control their systems and devices or the purposes of DSR at a broader (i.e. grid) level.



Those with greater understanding of and engagement with energy tend to have, or want to build, a deeper understanding about DSR and flexibility services. This might reflect roles and responsibilities.

All EMs will want to understand the impact for their business. But understanding how systems and devices are controlled might be more relevant to some Customer Operation Managers, for example if customers call upon them in the event of problems.

Dedicated EMs may want a deeper understanding, including how this fits into what's going on at a broader level, to understand and explain to their directors how they are reaching their energy goals and the impact of their business on emissions and the wider energy system.

Build Trust in DSR

EMs need to be able to trust DSR and understand the impact it will have on the functioning of their business.

Explaining the opportunities and risks of a DSR service will help EMs make an informed decision about whether it's suitable for them. Without this information, an EM may commit to a service and then be frustrated and dissatisfied if they experience some disruption, leading to poor customer satisfaction.

EMs will want to trial DSR and monitor what it is doing so they can measure its impact and ensure nothing goes wrong.

Try introducing a DSR 'lite' version where consumers can trial and test DSR. It's likely those with a greater understanding of and engagement with energy will want to do this multiple times to build up enough confidence and trust before fully committing.

Fundamentally, EMs need to be reassured that DSR will not negatively affect their business. The functioning of their business as well as their customer's and staff's comfort comes first.

What devices can DSR control?

EMs had some concerns over which devices and assets might be controlled by a DSR service.

Most EMs said they didn't want their Air Conditioning (AC) to be altered by DSR, as they were concerned it may have a negative effect on the thermal comfort of their staff and customers. The comfort of staff and customers is paramount to a business, and so some EMs are concerned about changes leading to complaints. Others see AC and heating as necessities which need to be on constantly.

There was also confusion over Electric Vehicle (EV) charging. EMs who were familiar with DSR understood how it could work with EVs, particularly if they had an EV fleet which was left parked overnight. But some EMs who didn't have EVs parked overnight, or who weren't familiar with EV charging, raised concerns over how DSR would work with their EV charging, and who should have control over this.

Based on their current understanding, EMs were unsure about what devices they felt comfortable with DSR controlling within their business. For example:

Concerned over DSR controlling:

Customer (tenant) spaces as it's up to customers to decide their own comfort as they pay their own bills.

Critical environments where usage needs to be reliable or constant e.g. server rooms that need to be constantly on and kept cool.

Anything that needs to adhere to building codes or regulations e.g. fresh air ventilation needs to be maintained.

Potentially allow DSR to control:

Maybe hot water.

Ice rink and swimming pool.

Maybe kitchen appliances like microwaves but customers still need to use it when they need it.

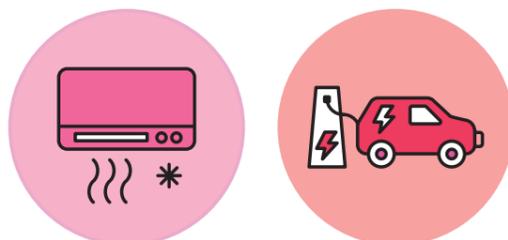
A phased approach to DSR

Many don't know enough about DSR to be comfortable to allow it to control all the energy use in their buildings, with concerns often raised about systems or devices which are critical to their business. However, this could change over time if a DSR service builds on their current understanding, to help them realise the impacts it will have on their business and explains how it will work for different assets and devices.

To help do this, consider having a phased approach to DSR. Allow EMs to test DSR with smaller or less critical devices at first, to build their confidence in the system, and later encourage them to allow control of larger assets.

Introducing some guaranteed outcomes could also help make DSR more appealing. For example, providing a guaranteed temperature range for AC units that the EM is comfortable with.

It's also important to remember that different businesses will have different devices and assets that DSR could potentially control, and some may have more than others. For example, smaller businesses may not have as many devices, or may not have control of particular assets in their building if it's owned by a landlord.

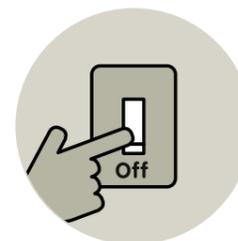


Control Vs Automation

An energy management solution could identify DSR opportunities for a business's assets and devices. This solution could either make recommendations which an EM then accepts or rejects, or it could implement these automatically.

Many EMs liked the idea of changes being implemented automatically. They felt it would save them time and effort, specifically when making small changes such as increases or decreases in temperature, which may be a particularly tedious task for EMs who manage large (or multiple) buildings. This would also be the case for those who have other responsibilities within their business.

However, EMs also require control. Many don't know enough about DSR to allow it to take complete control of their devices and assets. Whilst they see the positive side of automation, they are also cautious of the limits and risks of a fully automated system and believe there needs to be room for human intervention.



An override function is important

A successful DSR service should give EMs oversight of what DSR is doing to their devices and allow them to override certain actions from occurring should they detect any issues or receive complaints. This, along with a testing period or phased approach, can help make DSR more acceptable, as EMs will be able to monitor the impact and gradually gain confidence in the DSR system. Some EMs may need more control to accept DSR. For instance, deciding what devices DSR could potentially control, and setting their own parameters and limits for each device.

EMs might also be reluctant to allow DSR to change equipment schedules if they have taken time to build a schedule that works well for them. In this case they must be assured DSR is not going to have a negative impact on their business and that the benefits of DSR are worth making the change.

How will DSR work in larger businesses?

Dedicated EMs had questions over how a DSR tool would work for larger businesses.

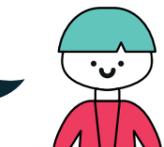


Who should be in control of DSR?

Dedicated EMs who manage multiple buildings will often have building operators who look at the day-to-day operations of a building. Some EMs are wary about making changes to a schedule which others monitor.

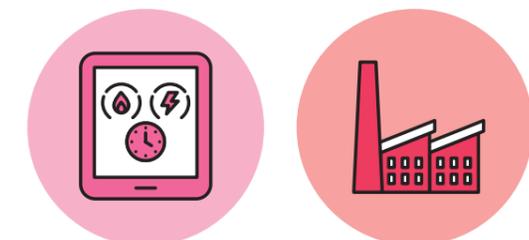
An energy service should consider this and have open conversations with businesses about who is the right person (or people) to have oversight and control of DSR, particularly in larger businesses.

Will DSR be incorporated within the Building Management/Automation System?



Some EMs in Canada felt that DSR would have to be integrated with their existing Building Automation System (BAS) for DSR to work. They could not see DSR working within an energy management tool alone.

This is something to make clear and outline within the service proposition. Some EMs will want to know exactly how DSR will work and what this means for their existing systems. EMs do not want to be logging into numerous tools, so integrating their BAS/BMS into a tool may be key.



Proposing DSR within an Energy Management Solution

DSR could offer valuable benefits to businesses, in particular energy efficiency and the potential for reduced carbon emissions and energy costs. When offered as part of an energy management solution it may offer further benefits, such as convenience or more refined visibility of energy consumption. These benefits should be emphasised and made relevant to each business.

To help further increase the uptake of a DSR service you should:



Sell the benefits of DSR – When introducing DSR, focus on explaining the benefits clearly, so that businesses can understand how exactly it will benefit them. As part of energy management, businesses will want to reduce their energy usage, carbon emissions and energy costs. Propose DSR as way to help them achieve these aims.



Show where DSR savings are coming from – This is a key need when it comes to energy management. Provide a quantifiable measure of the benefits a business will receive through engaging with DSR so they can measure the impact it is having. Then, later down the line, once they have built trust and DSR has demonstrated savings, EMs may give more control to the DSR system.



Provide insights and recommendations – In our previous paper ‘What does an Energy Management Solution look like for businesses?’ we highlighted that EMs want to be given insights and recommendations about their energy use, as it makes energy management simpler and more convenient.

Think about incorporating insights and recommendations for DSR. These recommendations should include what device(s) could potentially take part in DSR, and clearly define what DSR would be doing and the impact or saving it could have. This will allow EMs to see the potential of DSR.



Recommend assets for the business - EMs often investigate opportunities to improve the energy efficiency and management of their business. Having recommendations for investing in new assets, such as solar panels and batteries, that are based on their real energy data would be extremely valuable. Many EMs currently do this research themselves.

Some businesses may already have batteries or solar, in which case you should introduce DSR in a way which helps them take advantage of their existing assets by emphasising the benefits they could receive.

Consumers will not want or use something they do not understand. Building an understanding of energy and DSR should therefore be prioritised within a service proposition. Different EMs require different levels of understanding and detail about DSR. But at the most basic level they need to know how DSR works and be assured that it will not negatively impact their business. Trust and confidence in the DSR system is important.

For DSR to be part of an energy management solution, it must provide a clear benefit to the business. It should support businesses in reaching their energy management goals and help EMs get their jobs done more easily.

Want to know more?

Read our first insight paper ‘**How to help businesses manage their energy**’ to understand what people need when it comes to energy management, and the key Jobs Energy Managers want to achieve.

Read our second insight paper ‘**What does an Energy Management Solution look like for businesses?**’ to discover what an energy management solution requires to meet people’s needs and support Energy Managers getting their jobs done.

Energy-IQ project – who’s involved:

bruntwood

CATAPULT
Energy Systems

dunsky

hildebrand

iconics

Manchester
Metropolitan
University

Penso Power

q·Energy

CATAPULT
Energy Systems

Energy Systems Catapult supports innovators in unleashing opportunities from the transition to a clean, intelligent energy system.

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