

Collaboration and Green Leasing

A case study of the Swedish Energy Agency's new
office building in Eskilstuna

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Göteborg, December 2017
Internal project number: 2017:3

Beställargruppen lokaler, Belok, är ett samarbete mellan Energimyndigheten och Sveriges största fastighetsägare med inriktning på lokalfastigheter. Belok initierades 2001 av Energimyndigheten och gruppen driver idag olika utvecklingsprojekt med inriktning mot energieffektivitet och miljöfrågor.

Gruppens målsättning är att energieffektiva system, produkter och metoder tidigare skall komma ut på marknaden. Utvecklingsprojekten syftar till att effektivisera energianvändningen samtidigt som funktion och komfort förbättras.

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- Energimyndigheten
- Byggherrarna
- CIT Energy Management

Finansieringen av projekten delas normalt mellan Energimyndigheten och medlemsföretagen.

As requested, this report will be written in English.

ABSTRACT

The Swedish Energy Agency (“Energy Agency” from now on) moved offices during the autumn of 2017. In connection with the move, the ambition was to “live as one learns” and make sure that the new office became as energy efficient as possible. Furthermore, the leadership team promoted strong cooperation with the property owner around improving energy efficiency and sustainability in the fit-out. The office consists of a converted industrial facility, and the property owner has made major investments to adapting the building to the appropriate office environment, as well as striving for low energy consumption.

In connection with the cooperation that was initiated, the Energy Agency desired a customised “Green Lease” agreement. The idea of a Green Lease is that it will contribute to the industry's ongoing work on cooperation between property owners and tenants (such as Belok's specialisation group “Collaboration”) and the IEA DSM Programme's Task 24 (www.ieadsm.org/task/task-24-phase-2/).

A proposal for a customised (adapted) Green Lease has been developed (Appendix 1). Many relevant issues had already been regulated in an annex to the existing lease agreement. Thus, the customised Green Lease is a complement to the existing lease.

The lease between the property owner and the Energy Agency is a so-called *complete cold rental agreement*, where the Energy Agency pays for all purchased energy (heat and electricity). Usually, the property owner has limited incentives to make investments in such lease agreements, but, in this case, the property owner is interested and committed enough to take overall responsibility for energy efficiency and sustainability during fit-out.

One aim of the work of the “Collaboration group” is that all cost-effective (profitable) energy-efficiency measures are to be implemented. It is also envisaged that a financial regulation regarding investment and savings should then be made between property owners (landlords) and tenants. Limited remaining time periods of a lease shall not automatically prevent investments. The definition of cost-effectiveness (profitability) is based on the property owner's requirements, but any investment must also be profitable for the tenant. A couple of models for different situations are discussed, and the desire of this project is that a model is tested on some investment during the term of the lease.

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1 Background

During the Autumn of 2017, the Swedish Energy Agency moved to new premises with a new landlord. The Agency supports a number of initiatives regarding cooperation between property owners and tenants for increased energy efficiency (such as Belok's [incentive study from the autumn of 2016](#), Belok's "Collaboration group", and the IEA DSM programme's [Task 24 on behaviour change](#)). The Agency now has the possibility to actively participate as a party in a preliminary study on collaboration with property owners for increased energy efficiency. This directly improves their own experience of collaborating with property owners and gives greater credibility to property owners and tenants when disseminating their knowledge and experience on green leasing arrangements, both nationally and internationally.

In addition to the above-mentioned programmes, other initiatives by the Agency regarding energy visualisation, which are of value to engage the end users, are also supported.

The objectives of the pre-study are:

- Developing a Green Lease Agreement ("GLA"), based on existing "green leases", which includes regulation of investments and savings for energy-efficiency measures (with methods for verification). Other measures that reduce total energy costs for the property owner and ongoing operations should also be taken into account.
- To assist in, and follow up discussions and any negotiations in connection with investment decisions.
- To verify, where possible, the results of investments made.
- To spread results to interested parties including tenants' employees, using methods for some form of feedback visualisation (development of tools / software etc. for visualisation is not included in the preliminary study).
- To disseminate knowledge and experience, nationally and internationally, to interested parties.

DEFINITIONS

As Janda et al (2017) outline: "The term "*green leases*" usually reflects a change to the wording of a formal lease document; "*green leasing*" reflects a change to the relationship between the landlord and the tenant, which may be through the mechanism of the lease or through other channels.

2 Adapted Green Lease Agreement (GLA)

As a tenant, the Swedish Energy Agency has expressed the wish to sign an appropriate "Green Lease Agreement" (GLA) for its new office in Eskilstuna. The property owner (*Ladingen*) also has a high level of ambition regarding energy efficiency and sustainable solutions, so the conditions for success were promising.

The Swedish Association of property owners' "Green Lease" has become an industry standard and was included in the original discussion between the parties. However, this lease does not contain models for controlling investments and savings. Furthermore, it is unclear whether it is legally binding. Discussions during Task 24 workshops showed that potential for "green washing" was high. Thus, the desire for a customised (adapted) GLA became clear and it was chosen as the top DSM issue for Sweden for Task 24. The ambition is for the adapted lease to be tested so it can contribute to improved insights for interested stakeholders. The lease, version 1.0, can be found in Appendix 1a. Appendix 1b contains names of designated people for various responsibilities.

A major retrofit of the premises was undertaken before the Agency moved in, and a number of energy-efficiency measures have been implemented. Therefore, there is less potential for technological, large investments for energy efficiency. However, significant changes may still occur, which could open up further action. One paragraph in the agreement concerns investments and savings for large investments that do not "pay off" within the remaining time of the lease. The aim in this rental relationship and in several future projects is that "all cost-effective measures will be implemented, regardless of the remaining time of the lease", and the major task will be to find models to regulate the cost-benefits for such investments. In Appendix 1c, a model for such investments is suggested (Case 2).

3 Exchange of experience with other projects

The aim of this study was to contribute knowledge and experience to, and learn from the IEA DSM research collaboration, called “Task 24 – Behaviour Change in DSM Helping the Behaviour Changers”, which investigated the impact of users on energy use linked to green leases in Swedish office buildings. The research collaboration also undertook cross-country case study comparisons, thanks to one of its leading experts (Janda et al, 2017). The interaction with Belok has consisted of participations at workshops in October 2016 and May 2017, at which the Energy Agency and their new landlord, as well as “Behaviour Changers” from other sectors, such as research experts and the Swedish Green Building Council, also participated. In addition, ongoing discussions have been held during the Autumn of 2017. This work will be described in the “Final Report of the Swedish case study” (in prep). An ambition of the IEA DSM project was to conduct an interview survey with the Energy Agency's employees in connection with the move to the new office (possible survey questions, pre- and post-move, based on the Task 24 Subtask 9 “beyond kWh” tool were developed – see Appendix 2a)., but such a study has not been possible yet. However, some qualitative observations have been made via spontaneous discussions with employees, as well as collecting anecdotal evidence. Input and discussion can be found in the quoted conversations in Appendix 2b.

Furthermore, Belok's specialisation group "Collaboration" also engaged with the *Real Estate Owners Association*, with individual property owners, local tenants, trustees, consultants and other stakeholders. All Task 24 “Behaviour Changer” sectors, needed for successful achievement of a “Collective Impact Approach” (Kania and Kramer, 2011; Cobben, 2017) were thus present in this case study.

4 Methods for follow-up, feedback and visualisation

Proper follow-up is required to continually monitor the use of energy. Energy monitoring should be done monthly via appropriate systems with normal year-adjusted values for heat utilisation. The monthly outcomes shall be reviewed by both the landlord and the tenant for the purpose of detecting deviations and following up the outcome of implemented measures. Such an appropriate system can be the landlord's existing system, provided that the tenant's electricity usage is also included. Another suitable system could be instigated by the tenant. Selection of systems and designated managers can be found in Appendices 1a and 1b.

Feedback of the followed-up energy use to the tenant's contact person (often a dedicated building or energy manager) and the tenant's employees is a prerequisite for continuous commitment. A contact person for communication of feedback with the staff (e.g. an “Energy Master”) should also be appointed.

Visualisation of feedback is also very important for commitment. A Belok project is currently under way (and a planned follow-up that possibly includes the new office of

the Energy Agency is also under way). For this reason, the visualisation part of this study is not further elaborated here. For those who are interested in further study, the IEA project "Smart use as the missing link in district energy development: a user-centred approach to system operation and management" (a project within the IEA DHC | CHP Annex XI) is recommended.

5. Proposals for continued work

Energy Monitoring

It is useful to monitor energy use for several reasons. For research purposes, it is interesting to see how long it takes before trimming existing systems. Furthermore, there is value in detecting malfunctions, like warm water leakages. Finally, monitoring is of course important for verifying the results of investments or – although difficult to measure - behavioural changes in the form of reduced energy use.

Energy Champions

One thought discussed in connection with the Task 24 project is to enable employee commitment to energy efficiency and sustainability, particularly in the habitual behaviour change interventions. This can be done by engaging a group of staff “Energy Champions” who, together with the responsible contact person (see Appendix 1c) may be the tenant's interface to take advantage of the employees' and visitors' energy efficiency and sustainability proposals and discuss them in quarterly meetings. At the same time, the group will be co-responsible for disseminating information, feedback and any monitoring of behavioural outcomes (e.g. by using a modified version of the [Task 24 "beyond kWh tool"](#), Karlin et al 2015; Appendix 2a) to employers. Energy champion teams can have organised meet-ups, competitions and events to encourage staff and champions to engage with one another. One aspect that is really important to make such a proposal work is to have leadership buy-in and support (including the Energy Champion time as part of their KPI), a good relationship with a dedicated Energy- or Building Manager, and dedicated Champions who were not forced by their managers into the role.

Energy Data Visualisation

This is based on ongoing *Belok* work with *Academic Houses*, to develop the results for the Energy Agency's new office. Energy data visualisation is an important tool for user involvement, provided that visualisation is made simple-to-grasp and attractive.

Indoor Environmental Quality

There are challenges for both, the energy use and the indoor environmental quality in connection with the conversion of an industrial building to offices. Making use of the Energy Agency's new premises to undertake an interview survey with employees and potential visitors regarding the indoor climate and perceptions around (improved) energy efficiency and sustainability (for example, based on [Altomonte et al, 2017](#)) would be interesting.

Follow-up of model and test of more models for investment and saving

There are a few different ways to regulate investment and savings for those cases where cost-effective measures do not "pay off" within the remaining rental period. Within *Belok*'s "Collaboration" area, precisely the players who want to test such models are sought. Optionally, several models can also be tested at the Energy Agency's new office.

6. References

Altomonte S., Schiavon S., Kent M.G. & G. Brager (2017): Indoor environmental quality and occupant satisfaction in green-certified buildings, Building Research & Information, DOI: 10.1080/09613218.2018.1383715

Association of Property Owners' 'Green Lease':
<http://www.fastighetsagarna.se/gronthyresavtal>

Belok project "Hyresavtal med incitament för minskad energianvändning" (Swedish)
<http://belok.se/hyresavtal-med-incitament-minskad-energianvandning/>

Belok pre-study "Incitamentsavtal för energieffektivisering"/ "Incentive Leases for Energy Efficiency (English)
<http://belok.se/incitamentsavtal-for-energieffektivisering/>

Belok specialisation group "Samverkan" ("Collaboration"; all in Swedish):
<http://belok.se/samverkan/>
<http://belok.se/samverkan-gynnar-energieffektivisering/>
<http://belok.se/minskad-energianvandning-kraver-samverkan-och-ansvarstagande/>

Belok project in visualisation (Swedish):
<http://belok.se/prototyp-minskning-av-verksamhetsenergi/>

Cobben D., (2017). Subtask 6&7 – Case studies NL: Higher Education and ICT. IEA DSM Task 24: <http://www.ieadsm.org/wp/files/ST67-NL-ICT-case-study.pdf>

Janda K., Rotmann S., Bulut M. & S. Lennander (2017): [Advances in green leases and green leasing: Evidence from Sweden, Australia, and the UK, ECEEE Summer Study Proceedings, Hyères, France.](#)

Kania, J., & Kramer, M., (2011): *Collective Impact*, Stanford Social Innovation Review, Winter 2011. ssir.org/articles/entry/collective_impact.

Karlin B., Ford R. & C. McPherson Frantz (2015): Exploring Deep Savings: A Toolkit for Assessing Behavior-Based Energy Interventions. IEPPEC conference, Long Beach.

IEA DSM (2018). Task 24 – Behaviour Change in DSM: Phase 2 – Helping the Behaviour Changers. www.ieadsm.org/task/task-24-phase-2/

Appendix 1, Adapted Green Lease, ver. 1.0

The following agreement is a proposal for an adapted green lease for the Swedish Energy Agency according to their request, developed by the author of the report with inspiration from Belok's previous models from 2010, various green leasing agreements and Fastighetsägarna's "Grönt Hyresavtal".

Common agreements for tenant and landlord

§1 Energy monitoring should be done monthly via an appropriate system with normal year-adjusted values for heat utilisation. The outcome shall be reported to both parties on a monthly basis, and reviewing the follow-up shall be a standing point at quarterly meetings. Follow-up is being made to detect deviations and to follow-up the outcome of any measures taken. An appropriate system can be the landlord's existing system, provided that the tenant's electricity usage is also included. Another suitable system could be handled by the tenant. Appointed officers are listed in Appendix 1c.

Choice made in this case study:

- The landlord's existing system including the tenant's electricity use.

§2 Trimming of systems shall be conducted on a continuous basis with particular focus over the next 1.5 years. The responsibility is the responsibility of the landlord's representative. Reconciliation shall be made in connection with the agreed quarterly meetings. Representatives of the property owner as well as the tenant shall be appointed (see Appendix 1c).

§3 One night walk (after the closure of the office, but before the alarm has been activated) per year must be done to identify any "energy thieves". According to the author's recommendation, the timing is to be changed for when the night walk is carried out, based on season. The parties jointly designate (during the quarterly meeting) who will do the night walk and when to do it.

§4 The landlord ensures that an **energy survey** according to Belok's *Total Concept Method* (including cost-effective measures) is implemented by end of 2019. The energy survey shall include heating, cooling and electricity (both, real estate and office). ___% of the cost of the survey will be paid by the landlord, and the remaining share will be paid by the tenant.

§5 All cost-effective/profitable¹ investments for increased energy efficiency shall be implemented, provided feasibility². Profitability means that both the landlord and the tenant earn the investment. Measures for lower energy costs are financed by an agreement between the parties on a supplement to the rent over the agreed period. A

To be continued on the next page...

¹ The definition of cost-effective / profitable is based on the property owner's perspective, taking into account the district's "yield", cost of interest, life cycle cost and the tenant's willingness to contribute to investments provided that the investments provide a lower total cost for the tenant.

² Feasibility means amongst other things that the measures should not affect day-to-day operations too negatively. Landlord and tenant decide together feasibility, but convenience is not an obstacle to implementation.

Appendix 1a, Adapted Green Lease, cont'd

prerequisite for such additions is that these are lower than energy cost savings. The tenant has the opportunity to carry out energy-saving measures in his own premises by agreement with the landlord. Proposal for calculation model can be found in Appendix 1d.

§6 The landlord and tenant shall, at least every three years (starting with a quarterly meeting) collaboratively verify current tariffs for heating, power grids and water with regard to the most cost-effective tariff. In this connection, special attention is paid to the power (kW) of heat and electricity, and an hourly value analysis of these must be made.

In addition to the above mentioned points, the following points are part of the lease:

The tenant agrees through the agreement that they:

- Immediately inform property owners & their operating staff of changed utilisation times of the premises.
- Obtain agreement from the property owner prior to the permanent installation of electrical equipment (> 1 kW).
- Allocate an energy-responsible person who acts as a contact between the employees and the property owner. This energy-responsible person ensures that ideas from the "Energy Champions" and reach the property owner and vice versa (see Appendix 1c).
- Implement identified electricity-efficiency measures with short repayment time (3 years) within their own premises.
- Approve that the landlord collects consumption data from the tenant's electricity meter.
- Use only eco-labelled electricity.

The landlord is bound by the agreement to

- Follow the tenant's business to propose further improvements.
 - Actively monitor all energy types continuously per property on a monthly basis. If the use of energy suddenly increases for a tenant, the tenant will quickly be alerted.
 - Support and encourage operational staff in their work and continuously present energy usage statistics in the premises.
- Be ready to invest in cost-efficient measures for further reducing energy use.

Date:.....

Date:.....

For the tenant:

For the landlord:

.....
Signature.....
Signature.....
Name in print.....
Name in print

Appendix 1b: Responsible people (to be updated when changed)

In order for the work on energy efficiency and sustainability to proceed during the existing contract period, commitment, staff and resources are important factors. This Appendix specifies current names of „energy-responsible people“ with property owners and tenants. In case of personnel changes, Appendix 1c will be permanently updated. The persons mentioned in the cooperation so far are, for the renter, Kerstin Jansson and Evastina Hagen and for the landlord, Robert Johansson (facilities manager) and Mikael Fransson (property manager).

1. Responsible contact people for this Green Lease and for quarterly meetings:

Tenant:

Landlord:

2. Responsible people, energy monitoring:

Tenant: Kerstin Jansson

Landlord: Robert Johansson

3. Energy responsible person in the tenant's staff group:

.....

4. Responsible people, negotiations regarding profitable energy efficiency measures

Tenant:

Landlord:

Date:.....

Date:.....

For the tenant:

For the landlord:

.....
Signature

.....
Signature

.....
Name in print

.....
Name in print

Appendix 1c: Calculation models, investments

The ambition is that all profitable / cost-effective energy-enabling measures will be implemented. Profitability / cost-effectiveness should be defined from a life-cycle cost perspective (LCC) taking into account factors such as:

- increased property value
- the district's "yield"
- the real estate owner's calculation rate.

Implementation of the investment requires that an agreement on financial regulation regarding investment and savings is reached. If an agreement has not been made before the investment is made, regulation needs to be made retrospectively through a contractual negotiation. This Appendix contains regulatory proposals that should be tested for at least one investment during the term of the agreement. Identified, profitable measures must be practically feasible (which includes that they need to be able to be installed/implemented without disturbing the ongoing operations too much).

In the present case there is traditional *cold rent*, where the tenant pays for all their energy use (heat and electricity). When cost-effective measures are identified, it is primarily the landlord to take the investment, and the financing is done by the tenant accepting a rent allowance. The key to the implementation is that the tenant's total cost (basic rent, possibly rent allowance and energy costs) after investment must be lower than before the investment. The rent allowance may take place in different ways, and shall be negotiated on a case-by-case basis.

Basic principles for rent allowance:

- **As increased rent.** Raises property value, which benefits the landlord in the long term. Appropriate for actions that clearly consist of time, even with new tenants. Total cost: (basic rent and energy costs).
- **As a temporary *warm lease*.** This does not increase property value. Applicable to investments that "pay" within existing leases. The total cost of the tenant shall be lower than before the investment.
- **As a temporary addition to the rent** (monthly, yearly or as a one-off payment "up-front" when the energy measures are implemented).

A big bottleneck is how to handle **investments that do not "pay off" directly during the remaining lease term**. Two cases are then possible: The first case means that the property is in a good location (favourable yield) and that investments can raise the base rent a little bit, so that the property value increases enough that the property owner takes the investment. The second case means the opposite, which requires a bigger contribution from the tenant. The first case is illustrated by a calculation example, and the second with an image.

Case 1: Good location with favourable yield

Table 1 Example for a real case with favourable yield

	Yield: 5%	
	Investment: 5 Mkr	
Annual values	Before	After
<i>Tenant</i>		
Rent	40 MSEK	41 MSEK
Energy cost	10 MSEK	8 MSEK
Total cost	50 MSEK	49 MSEK
<i>Property owner</i>		
Management costs	20 MSEK	20 MSEK
Net profit	20 MSEK	21 MSEK
(Rent-manag. costs)		
Property value	400 MSEK	420 MSEK
(Net profit/Yield)		

In this case, the property owner plans to make a bigger investment. The tenant agrees to pay an additional 1 MSEK in annual basic rent against the annual cost reduction of 2 MSEK. The property owner guarantees that energy costs are reduced by offering to compensate the tenant if not. However, the increase in the basic rent is fixed. The property owner carries out the investment, as the property value increases from 400 MSEK to 420 MSEK. A problem that sometimes appears means either party trying to reach "millimetre justice", which often leads to prolonged negotiations, mismatches and halting the investment. The most common case is, however, that either party is overly materialistic, which leads to negligence and the stopping of investment. The starting point is that neither party may stop such a profitable investment for any of the reasons mentioned.

Case 2: Worse location with less favourable yield

The basic idea is that the tenant still has to earn on the investment, but that a regulation must in some way be implemented when the existing agreement expires. The property owner is at risk if the current tenant chooses not to stay on when the lease expires. In this case, the parties need to take the initiative to agree on a model where a settlement is made in connection with the termination of the existing lease agreement. If the tenant chooses to move to another landlord, the tenant will be liable for damages with a pre-agreed amount. If the tenant stays and signs a new agreement, the remaining "debt" will be settled in accordance with the new agreement. The illustration below illustrates the reasoning: the landlord and the tenant negotiate the

part that the tenant must pay for the landlord to be prepared to make the investment. The sum of the spaces marked with /// and \\ indicates the amount the landlord needs to save in order to make the investment. The tenant believes that the small savings he receives (the dotted part) is too small for the inconvenience, and suggests that he pays only the portion dashed with forward slash (///) over the remaining lease period. In addition, he agrees to further pay the part that is dashed with backslash (\\) if he chooses to move away from the premises at the end of the lease period. However, if the tenant decides to stay after the end of the lease period, the backslash (\\) is handled as part of the new lease negotiation. Most likely, the landlord will be pleased enough with the higher base rent caused by the investment.

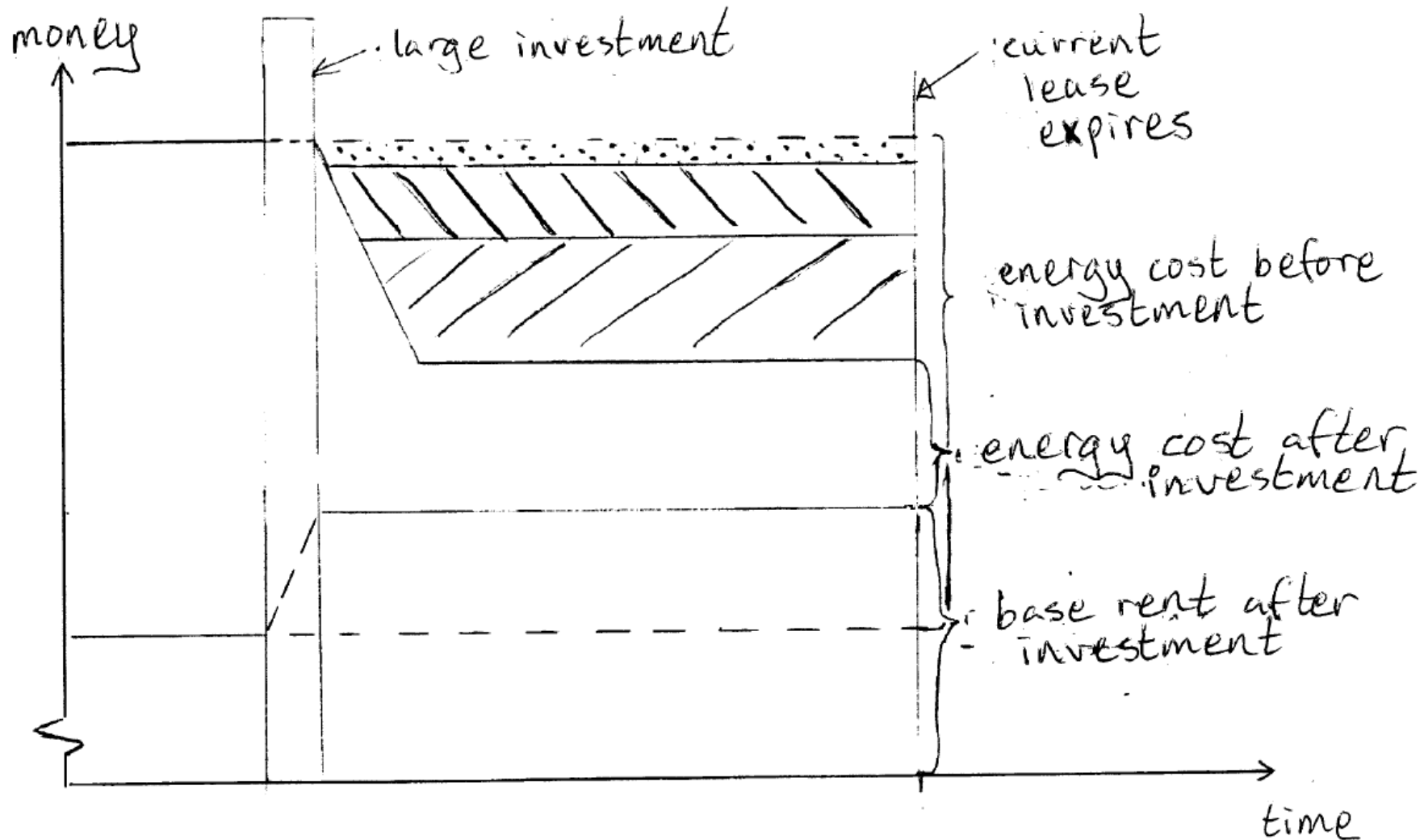


Figure 1: Model for investment and saving when the investment will not be paid back within the remaining time of the lease.

Appendix 2a: Draft staff survey questions based on Subtask 9 “beyond kWh” tool (see Karlin et al, 2015)

Please fill in this survey as part of IEA DSM Task 24 case study on green leasing

The Swedish Energy Agency has been part of the IEA DSM Task 24 research called "Behaviour Change in DSM" since 2012 (see www.ieadsm.org/task/task-24-phase-1/).

As part of the second phase of the Task (ieadsm.org/task/task-24-phase-2/), we are now turning behaviour change theory into actionable practice. In Sweden, our chosen topic and sector was green leasing in commercial office buildings.

We have held 4 collaborative workshops on this topic to date and have had excellent support from global experts on this topic (enabling comparisons between Sweden, Ireland, Norway, Australia and the UK).

We are now finalising this research by undertaking a case study with the Swedish Energy Agency. It will focus on the upcoming move to a new, retrofitted office building in Eskilstuna.

The Swedish Energy Agency and the building landlord already have a strong green leasing agreement in place. The building has been retrofitted to be sustainable, energy efficient and to enable high productivity and staff comfort.

Now, we are looking at the users of the new building: you. We are hoping to get some insights into your thoughts and feelings on energy use in general, and this move into a more energy-efficient building in particular.

This survey is built on the Task 24 "beyond kWh" tool which enables us to make the link between an intervention and how it actually affects human behaviour.

This survey will be fully anonymous. All answers will go directly to the Task 24 Operating Agent, Dr Sea Rotmann and will not be shared in any detail with the Swedish Energy Agency.

We hope that you will help us gain greater insights into how the people of the Energy Agency think and feel about (sustainable) energy in general and this move in specific.

We will run another survey in 3 months' time, after you had time to settle into your new buildings and hope you will help us collect your data by responding to that survey as well.

Many thanks, Dr Sea Rotmann (Task 24 Operating Agent)

Q1: In general, how much do you try to conserve energy in your workplace?

- A1: Not at all
- A2: A little bit
- A3: Somewhat
- A4: A great deal

Q2: If you said a little bit, somewhat or a great deal: How much does each of the following motivate you to save energy at your work place (not at all/a little bit/somewhat/a great deal)?

- A1: Environmental Impact
- A2: Cost of the energy bill to your employer
- A3: Convenience
- A4: Habit
- A5: Comfort
- A6: A healthy office environment
- A7: Keeping my energy use similar to others in the office
- A8: Moral obligation
- A9: Guilt
- A10: Learning about energy use
- A11: Practice what you preach (at the Swedish Energy Agency)
- A12: Trying new technologies

Q3: Please indicate how much you agree or disagree with the following statements (strongly disagree/disagree/neither agree nor disagree/agree/strongly agree):

- A1: I think of myself as part of an ecological community
- A2: I often feel a strong connection to nature
- A3: My energy use has a negative impact on the environment
- A4: If things continue on their present course, we will soon experience a major ecological catastrophe
- A5: Climate change is a problem for society

Q4: Please indicate how much you agree or disagree with the following statements (strongly disagree/disagree/neither agree nor disagree/agree/strongly agree):

- A1: Each individual has a responsibility to do his or her part for the environment
- A2: I don't see any problem with using a lot of energy
- A3: I feel morally obliged to reduce my energy use, regardless of what other people do
- A4: My colleagues expect me to do my part
- A5: My colleagues are trying to save energy at work

Q5: Please indicate how much you agree or disagree with the following statements (strongly disagree/disagree/neither agree nor disagree/agree/strongly agree):

- A1: The decision to use less energy at work is beyond my control
- A2: Taking action to reduce energy use at work is beyond my control
- A3: I am confident that I have the right skills to make informed decisions about how to better manage my energy use at work
- A4: I can think of at least one thing I can do to use less energy at work
- A5: I can reduce my energy use at work quite easily

Q6: Please answer the following questions about your energy habits at work. How frequently do you (almost never/rarely/sometimes/often/almost always):

- A1: Turn off the lights at work
- A2: Turn off your computer at work
- A3: Turn off the coffee machine at work
- A4: Use the hot water tap instead of the coffee machine

A5: Shower at work

A6: Turn on the dishwasher only when it's full

A7: Decide not to print something to save paper or energy

Q7: How frequently would you say you (almost never/rarely/sometimes/often/always):

A1: Think about your work's energy use?

A2: Think that other members of your team think about your work's energy use?

A3: Consciously make decisions to reduce your energy use at work?

A4: Think about how your office could save energy?

A5: Take actions to show others how your office could save energy?

Q8: Please indicate how much you agree or disagree with the following statements (agree/disagree/don't know):

A1: Turning the thermostat up higher will make the room get warmer more quickly

A2: Ceiling insulation can help keep the office warm in winter and cool in summer

A3: Reducing my water usage does not save energy

A4: Energy efficient light bulbs use less than half of the electricity of incandescent bulbs

A5: Washing dishes at lower temperatures uses less energy than higher temperatures

A6: Printing double-sided uses less energy

Q9: Please tell us what you think about the move to the new building and how it will affect your energy use and work routines (open ended):

Q10: Finally, please tell us something about yourself:

A1: What is your age bracket?

A2: What is your gender?

A3: Which team do you work in?

A4: How long have you worked at the Swedish Energy Agency?

A5: What is your highest level of education?

Appendix 2b: Relevant e-mail conversations with the IEA Task 24 experts

E-mail 1: Some features which would be interesting to study related to user behaviour

- "... we are interested in the behaviour aspects in a highly automated environment, which poses some interesting features:
 - People used to operating in such an environment are likely to leave everything to "the system" to take care of... which is maybe one of the key challenges. People above our generation knew to switch stuff off.... How do we keep this awareness/knowledge/motivation up?
 - The remaining efficiency measures can be related to
 - switching off equipment in one's nearby environment,
 - not leave windows a little bit open for long periods during the winter season
 - transportation to and from the office
 - video conferencing rather than meeting unless necessary etc. (I leave out things like how often to flush the toilet, how many cups of coffee and tea to have per day etc since there is a limit to integrity intrusion)
 - Some people with bad habits can gently be encouraged to change their habits, for example switch off anything that can be manually switched off
 - A need is to identify what can still be manually switched off – this could be an appropriate job for the energy champions
 - Some people may abuse "freebies"... charging one's phone at the office is of course OK, as well as charging one's electric bike battery... but what about charging the second bike battery... and what if someone starts sliding in his/her Tesla Power wall in the briefcase, plug it in in the morning in a one phase socket, and then goes home and enjoys "free power" at home...?! Such anomalies of course need to be addressed..... which leads me on to the
- Follow up of the day to day use.... Mainly to identify anomalies... this needs to be addressed..."

Email 2: What is being measured at Energimyndigheten's new office building?

"...to summarize the outcome:

- My focus is on Energimyndigheten's green lease as well as – if possible - verifying and giving feedback of any investments, which only to a small part involves tenants behaviour at this stage.
- Separate meters with logging functionality are currently being installed for five entities:
 - District heating (apart from the one owned by the district heating company)
 - Electricity for:
 - Ventilation
 - Cooling
 - Light
 - Tenant's electricity ("verksamhetsel")
- There are also some other separate meters (for example for each room), but currently without logging functionality. Reason being that only five "loggable meters" were available in the logging system (without extra cost).

- Sensors in each room determine presence including number of people, and thereby adjusts ventilation flows, temperature etc. At the same time, temperature can be set per room by users (within a certain range)
- There is a group of employees who will meet regularly to follow up issues like:
 - o Interior design
 - o Indoor environmental quality
 - Including reasonable indoor temperature (too hot or cold etc)
 - o Etc.

I mentioned ... that we would like to involve some engaged staff in this group, staff who also give feedback on and suggestions to energy efficiency related issues. Kerstin was open to this – but asked us to specify how this work should be conducted. I said we would get back on it, and this is where I have not had time to look into exactly how we should do it.
- I would need help to formulate what we would like the engaged staff to do/look at....”

E-mail 3: Some input from staff after visiting the new office

- “The receptionist lady was blinded by the sun in the afternoon due to that the power supply to the “fancy” Chromogenics’ windows had not yet been connected. The afternoon sun also made the temperature in the reception area too high at times (Swedish November sun). These issues are expected to be solved once the windows are power supplied, so that the shading kicks in as it should.
- In general, the staff seemed understanding with the issues of some colder areas in the building due to the circumstances (just moved in, systems not fully adjusted etc.). The fact that they are able to move around helps....
- Initially, Kerstin has weekly meetings with staff to pick up any issues with the new facilities... including things like smell and emissions from new furniture that is disturbing to some, some too cold areas, furniture issues etc.
- After that, there will be regular meeting with group managers etc. to pick up any issues... these meetings could accommodate “energy champions” or whatever they would be called...
- Kerstin and a colleague will have quarterly meetings with the property owner, where they discuss indoor environmental issues as well as other “problems” with the daily operations... here, we would like to also follow-up energy use and peak demands etc.
- The property owner will have two people allocated for these quarterly meetings (as well as any immediate issues)”.