Between July and November 2010, artist Lucas Ihlein is carrying out an ENVIRONMENTAL AUDIT. The audit was commissioned by the MCA as part of this exhibition, IN THE BALANCE, which, as you already probably know, tackles “environmental concerns” and the thorny territory surrounding “sustainability.”

If you wanted to sound clever, you could say that the audit is a kind of “META-PROJECT” which turns attention back onto the exhibition itself.

In an environmentally-themed show, what RESOURCES are consumed, and what EMISSIONS are produced?

In other words, WAS IT WORTH IT?

ENVIRONMENTAL AUDIT consists of a BLOG, a series of PRINTED DIAGRAMS, a bunch of conversations, and about 4 months of TIME.

Of course, as an artist in the exhibition, Lucas will also be AUDITING HIMSELF.
ENVIRONMENTAL AUDIT

BY LUCAS IHLEIN
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“BECAUSE YOU’RE WORTH IT” BY MEG ULMAN

This project has been assisted by the Australian Government through the Australia Council, its arts funding and advisory body.

Dr Lucas Ihlein is the recipient of an ARC Discovery Early Career Research Award funded by the Australian Government.
In early 2010 curator Glenn Barkley called me up with a strange and interesting proposition. He explained that the Museum of Contemporary Art in Sydney was preparing a large scale environmentally themed exhibition called In the Balance: Art for a Changing World. Would I come and conduct an environmental audit of the show? I didn’t know what an environmental audit was, let alone how to do one, Glenn was OK with that. So we drafted up a contract that involved me in a dual capacity. I would be one of the artists within the exhibition, and my artwork would involve auditing that same exhibition. The MCA paid me a stipend for four months to be on duty, with an ‘office’ in the gallery space, generating an ever-evolving work of live art.

My general approach to these oddball commissions is to create a new project blog and declare my ignorance publicly on day one. Then I scramble around finding out how to do the task, reporting regularly on my process of discovery. The early bits of the Environmental Audit blog are, unsurprisingly, characterised by floundering and self-doubt about my lack of skills, and they include a proliferation of hastily scrawled diagrams which reveal my groping towards knowledge.

A ‘proper’ environmental auditor is a sort of engineer who has gone through a training program and is paid (like a sophisticated tradie) to provide an official report on the environmental impact of an activity or organisation. Obviously I had none of this training. Should I go get trained? I decided not to, choosing instead to learn on the job and muddle my way through.
During the time I was engaged on the project, the MCA was undergoing a major renovation, and had hired a company called Steensen Varming (SV) to advise on high level environmental sustainability measures. I went to talk to them, Chris Arkins from SV advised me to set limits and parameters to manage the scope of what I would measure in my audit. ‘Otherwise Lucas,’ he said, ‘you’ll go mad’.

One of the first diagrams I made was called ‘But is it an Audit?’. This was an attempt to work out the boundaries of my project. Although Glenn had invited me to carry out the audit, he hadn’t specified how I should do it, nor had he demanded specific outcomes. That was all up to me.

It is this autonomy regarding process and product which distinguishes Environmental Audit as a work of socially engaged art from the ‘bona-fide’ work carried out by Steensen Varming.

I decided that if the engineers set strict limits and parameters for themselves to avoid going mad, then I should probably go in the other direction. So I embarked on a process of listening to the people involved in the museum (the engineers would probably call them ‘stakeholders’), allowing the shape of my audit to emerge from their concerns.

The word ‘listening’, as I discovered in my first diagram, has the same origin as ‘auditing’, so I took that as my core duty, and the whole project spiralled out from there.

The other thing I held onto was a set of impossible, unanswerable, questions. OK, so the MCA was presenting an environmentally themed art exhibition. Well, what was the ‘function’ of this exhibition? Was it to try and influence behavioural change in its audience? In putting on the show, what resources were consumed, and what emissions were produced? Did the negative environmental impact of the show outweigh its cultural benefits? In other words, was it ‘worth it’?

By what criteria do we judge the processes and manifestations of human culture? This question of evaluation went to the heart of my audit, and informed all the interactions I had with museum workers, with other artists in the show, and with the hundreds of gallery visitors who came to spend time with me in my public Audit Office.

Some of these conversations were processed into large hand-drawn diagrams, printed as offset lithographs at Big Fag Press, and reintroduced to the museum to be hung on the walls during the exhibition. I also wrote dozens of stories about my experiences for the Environmental Audit blog – far too many to reproduce here. Instead, think of this publication as a souvenir focusing on just one aspect of the overall project: my attempt, with the help of my intern (fellow artist Louise Kate IHlein), to tally up the environmental impact of all the artworks in the exhibition.

So - in these pages you can follow along as Louise and I map out each electrical appliance and every light fitting in the exhibition. You’ll see us consulting with local experts to calculate and multiply all the wattages. And you’ll find out how many tonnes of carbon dioxide were generated by the exhibition as a whole (it’s an impressive figure!). The entire exercise was a ham-fisted pantomime of what we imagined a real environmental auditor might do. But our aim was to demystify the process, as well as to produce some gnarly information graphics to print up on the Big Fag Press (you can see the resulting diagrams reproduced as fold-outs on the inside covers of this book).

If you’re curious to explore other aspects of the Environmental Audit project (like how museum walls are made, the ethics of recycled paper, how artists can audit themselves, and the MCA’s early efforts to set up a staff-run environment committee) you can visit the project website at <http://environmental-audit.net>.

Ultimately, as Meg points out, Environmental Audit was not about making judgments. There is no ‘bottom line’. Rather the project involved prising open the habits and habits of artmaking and exhibition production, to enable deeper scrutiny of some things we take for granted.

Lucas Ihlein, March 2018
Environmental Audit – The Bottom Line?
http://environmental-audit.net

LUCAS IHLEIN, ENVIRONMENTAL AUDIT: THE INS AND OUTS OF AN ARTWORK ON SHOW IN THE MUSEUM – AN INCOMPLETE ESTIMATION, OFFSET LITHOGRAPHIC PRINT, 70X100CM, PRINTED AT BIG FAG PRESS, 2010.
Exciting times in Audit Office. I’ve been joined by Louise Kate Anderson – pictured above – my new intern! If she can bear it, in between finishing her design degree Louise will be helping me out on some of the trickier aspects of my work at the MCA. The first of her tasks, early last week, was to assist with carrying out The Great MCA Third Floor Lighting Survey.

This was by no means an easy task. Nor was it the first attempt at such a survey. Nor is it yet finished. I’ll explain why...

The idea was that we would draw up a big map of the third floor of the museum – the level on which The In the Balance exhibition is housed. The map would show each and every room and all the artworks housed therein. We would then wander around the gallery, plonk ourselves on the floor in each room, and count all the light fixtures.

Theoretically, upon completion of this task, we could multiply the amount of fixtures by the relative wattage of each one and come up with an overall energy consumption figure for the entire exhibition. I feel exhausted just thinking about it.

It’s the sort of job you’d want to get somebody else to do for you. And in fact, a few weeks ago, I did just that.

Here’s Zephyr, the youngest member of Artist As Family carrying out the preliminary study for The Great Survey (Zephyr’s the short one in the foreground. The tall one is Chris, the MCA preparator). On the day before he left to go back to Daylesford, Zephyr was wandering around the galleries looking like he needed a job. So I gave him a scrap of paper and a red pen and asked him to take note of all the lights in the show. If we peer over his shoulder we can see how he did it.

Each light has a different shape and they’re kinda hard to describe in words (‘the triangular ones’, ‘the cylindrical ones’ etc.), so we tried to draw a picture of each one that would be instantly recognisable. Unfortunately, later on, when I showed Zephyr’s handiwork to Nicky (the MCA’s lighting guru) she looked crestfallen. ‘But I’ve changed the lights since he did that survey!’ she groaned.

Hence the need to do it all again. And, on the upside, the chance to do it even more obsessively. So... in the image above you can see a close-up of the bottom of the newly completed Survey Map, showing a small portion of the different types of lighting fixtures which are used to illuminate the show.

Once we started looking, we spotted the following:

- triangular lights (103)
- cylindrical lights (53)
- stubby cylindrical lights (4)
- funny ‘H’ shaped swivelly lights (14)
- lights embedded flush with the ceiling (1)
- green coloured exit lights (14)
- fluorescent tubes (50)
- long pointy directional lights (17)
- dangling-from-a-long-cord lights (9)
- cone-shaped lights (15)

...not to mention the following peripheral (and not-so-peripheral) ‘electrickery’:

- video projectors of various sorts (10)
- large and small LCD screens (8) and plasma televisions (1)
- a laptop (1: mine)
- some Macintosh computers connected to the internet (5)
- an electric whiteboard (1)
- motion sensors (18)
- smoke alarms (21)
- amplifiers and speakers (18)
- one photocopier machine and one printer (both in the library)
- closed-circuit television cameras (10)
- temperature and humidity sensors (2)

...and:

- unidentified electrical objects (5)

Holy coal-fired power stations, Batman! Strap me in and throw...
In fact, the only works in the show as a random sample: the room where Jeanne Van Heeswijk and Paul Sixta have their amazing installation about the Goulburn Waste Processing operation (where Sydney sends over 60 truckloads of trash every day).

It seems from our chart that this room (which also houses a small display of a blog and some digital prints by The Artist As Family) needs 23 triangular lights and 5 cylindrical lights, as well as 3 computers and two smoke detectors.

To a lesser extent, you could also include Lauren Berkowitz’s plants in this category as they live part of their lives soaking up the rays on an external balcony.

Let’s take just one of the spaces in the show as a random sample: the room where Jeanne Van Heeswijk and Paul Sixta have their amazing installation about the Goulburn Waste Processing operation (where Sydney sends over 60 truckloads of trash every day).

Now, I have to re-state: the above figures are very rough. The next step for Louise and I will be to spend some time with Mark (the MCA’s audio-visual guru) and Nicky (the lighting maven I mentioned above) in order to obtain more precise figures for each particular fixture and electrical appliance.

Inside the front flap of this book you’ll find the final chart, minus the calculations. By the time this is all over, we should be able to work out something of a ‘total carbon emissions’, (not counting air conditioning of course) for the third floor of the museum.

To do a lighting audit you better make sure you know what sort of light you are measuring to gauge energy consumption. If the lights are using compact fluoro light they will use less energy than a halogen globe. A Fluoro Baton will use less energy as well. You also better find out if the lights are dimmed; if they are they will again use lots less energy. Most of a light’s energy is lost in heat, different lights and settings will give you different results. You also better find out if the Exit and Smoke Alarms run on batteries or are connected to the main power supply. An audit of this complexity really needs to be done by an engineer otherwise your results will be very unreliable.

I should add that there are big issues at stake in the quest to improve the lighting scenario.

From the above it should be obvious that the MCA is running on an ‘old fashioned’ lighting system, rather than using new ‘energy saver’ bulbs. The old fixtures can’t take the new-generation bulbs. To use new bulbs, you need to invest in new fixtures. But each new lighting fixture costs hundreds of dollars, so to replace the whole gallery’s lighting would be a massive expense. And yet that is what would be needed before the museum could begin saving money on its electricity bills (and of course, before it could reduce its carbon emissions too).

See the dilemma? Need to have money to save money.

I had a long chat with Tony Migell, the preparator-boss about this today. I am hoping if he has time, he’ll chime in here with the fine details, as he’s really done some thorough thinking on all these matters.

It seems that ‘the market’ for new generation LCD lighting is moving rapidly and within a year or so there will be some high performing, not too expensive options available.

7 RESPONSES TO “THE GREAT THIRD FLOOR LIGHTING SURVEY”

**PAUL SIXTA SAYS:**
September 7, 2010 at 1:51 am

You’ve left out the flat screen on the wall. No idea how much power that takes.

**LUCAS SAYS:**
September 7, 2010 at 8:07 am

Damn, thanks Paul. How’d we miss that? I’ll add it.

**TEO SAYS:**
September 7, 2010 at 2:52 pm

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**LUCAS SAYS:**
September 7, 2010 at 5:05 pm

Thanks Teo. Yep, it’s all part of the process.

I’m working with Mark the Preparator to determine as many of these variables as we can.

Naturally, an engineer would do a better job than me, but that’s not going to stop me trying! Part of this project is about finding the limits of what the ‘layman’ can do without being intimidated by the need for an expert.

It sounds like you know quite a lot about this stuff – let me know if you have any further tips.

thanks,
Lucas

**LOUISE SAYS:**
September 7, 2010 at 7:09 pm

Wow, it sounds v. cool written up like that. It was an interesting exercise – hopefully we made up in enthusiasm what we lacked in technicality.

**LUCAS SAYS:**
September 7, 2010 at 8:19 pm

Indeed we did Louise! And the document already does seem to have some value as an explanatory tool pinned up in the gallery, regardless of the final emissions results.

**LUCAS SAYS:**
September 7, 2010 at 8:25 pm

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It seems that ‘the market’ for new generation LCD lighting is moving rapidly and within a year or so there will be some high performing, not too expensive options available.
After making a start (thanks to Louise the Intern) on The Great Third Floor Lighting Survey, I knew that I needed to dig deeper. So last week I spent some time with Mark Brown and Nicky Bryant, both MCA preparators, both experts in the fields of audio-visual technology and lighting respectively.

In the image above you can see Mark, painstakingly working through each and every annotated video projector, LCD screen, DVD player, Macintosh computer and miscellaneous ‘doohickey’ from our survey chart.

Mark is an artist. He has a particular interest and enthusiasm for Institutional Critique, partly because he’s insatiably curious about the behind-the-scenes workings of art galleries.

In fact, this is precisely what Mark views my chats as we pass by each other on the way to the lift or the loo. Unique amongst his colleagues, Mark views my Environmental Audit primarily through the lens of institutional critique: that sc rawe field of contemporary art whose focus is the politics of exhibition and museum practices. I want to spend a small moment thinking about this now.

According to the trusty ole wiki, Institutional Critique is an art practice which ‘seeks to make visible the historically and socially constructed boundaries between inside and outside, public and private’ of the art world itself. A classic example of this is Hans Haacke’s intervention at the Guggenheim Museum.

Haacke’s project Shapolsky et al. Manhattan Real Estate Holdings, A Real Time Social System, as of May 1, 1971, revealed the dense network of questionable business dealings of shady businessman Harry Shapolsky. The exhibition was cancelled before it even opened.

According to some, it was speculated that Shapolsky’s friends on the Guggenheim’s board of trustees were responsible for the cancellation, although the allegation was never proved. The point here, of course, is that Haacke’s work succeeded precisely by being shut down. The act of cancellation revealed the network of influences between Shapolsky and the Guggenheim in a powerful and practically demonstrated way.

There has been much discussion in recent years about whether Institutional Critique has now been co-opted by the institutions themselves. Take my Environmental Audit, for example. You could argue that it performs an institutional critique of the MCA’s environmental policies and processes - as it reveals some less-than-perfect aspects of the way the museum functions. On the other hand, you could argue that the very fact that the MCA has commissioned this critique is a public demonstration of its fundamentally progressive nature. Or if you had three hands, you could conclude that the MCA has co-opted institutional critique in order to avoid being accused of hypocrisy for putting on a large, polluting exhibition about the environment.

...and so on.

But for now, I should get back to the point at hand ... which is, that with Mark’s help, I managed to get a relatively accurate wattage for all those video projectors, amps and televisions which prop up the third floor of contemporary art whose focus is the politics of exhibition and museum practices.

So in the spirit of this sage suggestion, I proposed to Mark that we consciously ‘bracket out’ the influence of the heat produced by the lights and projectors. Such heat thus becomes a factor ‘not to be reckoned with’ - from the point of view of the museum’s air conditioning systems, then you begin to see them not in the service of lighting and visualisation, but as heating machines.

And so the cascading effects of one element upon another continue to unfold. I was, however, heartened to be reminded of something told to me by Chris Arkins, an engineer who works for Steensm Varming, when I went to visit him a month or so ago. (Chris is currently consulting with the MCA on environmental initiatives incorporated into the development of the museum’s new building extension). I asked Chris for some advice on how to carry out my audit. ‘Lucas, if there’s one thing I can suggest, it’s this’, he said. ‘Set yourself some boundaries, or else you’re going to go completely mad’. So in the spirit of this sage suggestion, I proposed to Mark that we consciously ‘bracket out’ the influence of the heat produced by the lights and projectors. Such heat thus becomes a factor ‘not to be reckoned with’ - from the point of view of the museum’s air conditioning systems, then you begin to see them not in the service of lighting and visualisation, but as heating machines.

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4 RESPONSES TO “CONTINUING ILLUMINATIONS”

KRYSTAL SAYS:
September 13, 2010 at 6:50 pm
Have visited In The Balance numerous times now and each time the piece that stays with me most when I leave is Environmental Audit. I think that it strikes a beautiful balance between art and ‘research project’ for lack of a better term. Perhaps the collation of data sits somewhat awkwardly in the gallery space, but this is what gives it its appeal, at least in my opinion. To be honest I hadn’t really considered the environmental impact of an exhibition, I think at times we feel the end justifies the means perhaps? But surely with all we know we can make better choices; turning the spotlight on the bones of the exhibition simplified this and made me in an instant consider things I hadn’t considered. Facilitating change is indeed a beautiful thing. I’m rambling… in summation, kudos to you Lucas.

DON SAYS:
September 19, 2010 at 11:39 am
Hello Lucas, I saw you in the environmental audit about 2 weeks ago.
I want to continue the conversation we were having about economics, not least because momentum is a gathering on economics that is better suited to the 21st century, e.g. the statement by the CEO of BHP that there needs to be a price on Carbon.
This is pertinent because any efforts to rein in greenhouse gas emissions will only be successful if the source of those emissions is better described and understood.
Then enter stage left things like ‘judicious affluence’. I will be able to explain that to you, but it would take an artist to convey the embodied idea in a captivating manner.
There are a few other people I am getting together on economics – people who have been thinking long and hard about it – and I reckon that it would be mutually rewarding to bounce some ideas around.
Cheers, Don.

LUCAS SAYS:
September 19, 2010 at 11:41 am
Don, I really enjoyed talking with you when you visited the exhibition, and I’m looking forward to discussing economics further. It’s part of ‘my education’ in this project to get to grips with the carbon emissions versus carbon tax systems, so I hope you can help with that. And I’ll be happy to put my visualisation methods to work in trying to show this all on a single page, if that is at all possible!
Cheers,
Lucas

LUCAS SAYS:
October 5, 2010 at 3:11 pm
I just got an email from my friend the artist Keith Armstrong, who has for a few weeks been badgering me to address the issue of the environmental footprint of computers and online downloads (a hidden component of my own project).
Keith writes:
Hey Lucas
Re: the ‘weight’ of the internet. Check out this article by Sean Cubitt – I thought it quite powerful
We can probably reckon on every web search costing roughly 0.2g of CO2 – and the very worse of all worseness being downloading video (i.e. massive)... so don't download it or post it?
In related matters, Keith also referred me to the Coltan Wars in the Congo – conflicts which have largely been funded by the profits gained from columbite-tantalite metallic ores from which many of our electronic components are manufactured.
In which our hero recounts his double-pronged attempt to produce a numerical figure representing the greenhouse gas emissions produced by the In the Balance exhibition at the MCA, and wonders what to do with the results...

Having spent time with Nicky and Mark getting all the wattages for each light fixture, each video projector and each television screen in the gallery, Louise and I were then faced with the task of adding them all up.

But first, Mark summoned Campbell The Electrician to help out. Campbell arrived with a tool which would, potentially, make all our adding up unnecessary: The Ammeter.

With a very excitable Mark champing at the bit, we brave explorers plunged into the bowels of the building: concrete corridors threaded with large air-ducts and fat, colourful, dangerous-looking multicoloured cables, copper pipes – many clad with aluminium foil – and ancient looking dials and sheet metal boxes painted with turquoise enamelled. A deep humming

Campbell dusted off an electrical box, uncrewed the security bolts and clamped his trusty ammeter onto the three big wires leading out of the top of it.

And here’s how it panned out. (Warning - the below gets a bit technical at times, don’t feel bad if your eyes start to blur, it happened to us, too.)

By testing and adding up all 3 ‘phases’ of the lighting and electricity circuit, Campbell calculated that the current is 102.2 Amps.

To calculate the wattage you multiply amps by volts. Thus, the total wattage is 102.2 amps x 240 volts = 24,528 watts.

This total wattage (24,528 Watts: 25 kilowatts per hour – equivalent to running 25 of those little oil bar heaters simultaneously!) breaks down, across the different distribution boards, to about 13.5 kw per hour for lighting and the remainder – about 10.5 kw per hour – for the video projectors, televisions and other sundries.

Campbell then turned to the separate electrical board which distributes power to the air-conditioning and humidity systems. The seasoned electrician clamped his ammeter onto the wires, and then emitted a slow, low whistle. ‘Lucas, I don’t think you want to know this’, he said. But he told me anyway: ‘Air conditioning pulls more than double the power of the lighting circuits’.

And indeed, the machinery which heats, cools, and humidifies the MCA galleries adds up to a whopping 67.5 kwH.

Remember that we’re only talking about Level 3 of the MCA, not the whole building.

Also remember that air conditioning runs 24 hours a day. We’ll come back to that later.

Having discovered these sobering truths, I returned to my office. Louise (my trusty intern) and I were then faced with the task of what to do with our nitpicky detailed survey of all the lights on Level 3. We decided to go ahead and add them all up anyway, to see how our figures matched against Campbell’s measurements.

Since our first map (see inside front cover fold-out) was getting a bit too full, we started a second map. We inserted our calculations for each gallery space in the exhibition (see the new map on the inside back cover fold-out).

And here’s the resulting map:

If you wanted, you could make a league table of the greatest emissions in the show. For instance, the most electricity-hungry room in the exhibition is the double-height space containing the Future Farmers, Lauren Berkowitz, Emily Floyd, and Lorraine Connelly Norrey. It draws nearly 6000 watts per hour. The main reason for its large consumption is that the gallery is very tall and so the lights deployed need to be of a high-wattage to illuminate the space.

The highest consumption by an individual artist looks to be Andyva Rovers, whose use of multiple digital screens and lighting in the same space pushes up to 3780 watts per hour.

But anyway, I’ll leave aside the analysis of individual works for the moment.

Next, Louise and I tallied up all the rooms, to give a total lighting/electricity consumption for the entire exhibition. The result: 24,995 watts per hour.

I must say, we were very pleased with ourselves. This calculation is only 467 watts higher than the reading on Campbell’s ammeter (which Campbell himself had admitted can have a 1% margin of error).

To convert our 24,995 watts into a total electricity consumption for the whole life of the exhibition, we had to multiply it by the total number of hours that the lights are switched on. With a little help from Seb (who oversees the daily running of the gallery spaces) we estimated this at 612 hours. Thus, by multiplying 24,995 watts by 612 hours, we come to a total of 15,297 kilowatt hours (or 15,297 megawatt hours).

But what does this mean?

I rang AGL, the company that provides electricity to the MCA. The nice customer liaison lady Fiona was very knowledgeable about carbon emissions and how they relate to energy usage. She

In which our hero recounts his double-pronged attempt to produce a numerical figure representing the greenhouse gas emissions produced by the In the Balance exhibition at the MCA, and wonders what to do with the results...

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With a very excitable Mark champing at the bit, we brave explorers plunged into the bowels of the building: concrete corridors threaded with large air-ducts and fat, colourful, dangerous-looking multicoloured cables, copper pipes – many clad with aluminium foil – and ancient looking dials and sheet metal boxes painted with turquoise enamelled. A deep humming

Campbell dusted off an electrical box, uncrewed the security bolts and clamped his trusty ammeter onto the three big wires leading out of the top of it.

And here’s how it panned out. (Warning - the below gets a bit technical at times, don’t feel bad if your eyes start to blur, it happened to us, too.)

By testing and adding up all 3 ‘phases’ of the lighting and electricity circuit, Campbell calculated that the current is 102.2 Amps.

To calculate the wattage you multiply amps by volts. Thus, the total wattage is 102.2 amps x 240 volts = 24,528 watts.

This total wattage (24,528 Watts: 25 kilowatts per hour – equivalent to running 25 of those little oil bar heaters simultaneously!) breaks down, across the different distribution boards, to about 13.5 kw per hour for lighting and the remainder – about 10.5 kw per hour – for the video projectors, televisions and other sundries.

Campbell then turned to the separate electrical board which distributes power to the air-conditioning and humidity systems. The seasoned electrician clamped his ammeter onto the wires, and then emitted a slow, low whistle. ‘Lucas, I don’t think you want to know this’, he said. But he told me anyway: ‘Air conditioning pulls more than double the power of the lighting circuits’.

And indeed, the machinery which heats, cools, and humidifies the MCA galleries adds up to a whopping 67.5 kwH.

Remember that we’re only talking about Level 3 of the MCA, not the whole building.

Also remember that air conditioning runs 24 hours a day. We’ll come back to that later.

Having discovered these sobering truths, I returned to my office. Louise (my trusty intern) and I were then faced with the task of what to do with our nitpicky detailed survey of all the lights on Level 3. We decided to go ahead and add them all up anyway, to see how our figures matched against Campbell’s measurements.

Since our first map (see inside front cover fold-out) was getting a bit too full, we started a second map. We inserted our calculations for each gallery space in the exhibition (see the new map on the inside back cover fold-out).

And here’s the resulting map:

If you wanted, you could make a league table of the greatest emissions in the show. For instance, the most electricity-hungry room in the exhibition is the double-height space containing the Future Farmers, Lauren Berkowitz, Emily Floyd, and Lorraine Connelly Norrey. It draws nearly 6000 watts per hour. The main reason for its large consumption is that the gallery is very tall and so the lights deployed need to be of a high-wattage to illuminate the space.

The highest consumption by an individual artist looks to be Andyva Rovers, whose use of multiple digital screens and lighting in the same space pushes up to 3780 watts per hour.

But anyway, I’ll leave aside the analysis of individual works for the moment.

Next, Louise and I tallied up all the rooms, to give a total lighting/electricity consumption for the entire exhibition. The result: 24,995 watts per hour.

I must say, we were very pleased with ourselves. This calculation is only 467 watts higher than the reading on Campbell’s ammeter (which Campbell himself had admitted can have a 1% margin of error).

To convert our 24,995 watts into a total electricity consumption for the whole life of the exhibition, we had to multiply it by the total number of hours that the lights are switched on. With a little help from Seb (who oversees the daily running of the gallery spaces) we estimated this at 612 hours. Thus, by multiplying 24,995 watts by 612 hours, we come to a total of 15,297 kilowatt hours (or 15,297 megawatt hours).

But what does this mean?

I rang AGL, the company that provides electricity to the MCA. The nice customer liaison lady Fiona was very knowledgeable about carbon emissions and how they relate to energy usage. She
informed me that the ‘emissions factor’ generated by the coal-fired power station was 0.9kg of ‘equivalent carbon dioxide’ per kilowatt hour.

According to Fiona, equivalent carbon dioxide (CO2-e) is a term used to bundle other, even more harmful greenhouse gases, into the equation alongside the good old CO2, including methane and nitrous oxide.

However, this emissions factor has to be bumped up to take into account the carbon emissions in the production of the power in the first place (mining the coal etc.), as well as losses in transmission of power along the cables between the power station and the MCA. The ‘average total emissions factor’ which results is approximately 1.07kg of CO2-e per kiloWatt hour.

**THUS:**

– if we multiply our total kilowatt hours by 1.07kg, we come to a total mass of greenhouse gas emissions. That number, folks, is 16,368kg – more than 16 tonnes.

If anybody is still reading this, I’m afraid we’re not quite finished yet!

To get a total which takes into account the air conditioning systems, we need to multiply the total wattage of the air conditioning (67.536 kw per hour) by the total number of hours for the exhibition. Remembering that in order to keep the artworks at a constant temperature and humidity, the air conditioning must run 24 hours a day, the total duration of this load is 72 days x 24 hours = 1728 hours.

Thus: 1728 hours x 67.536 kw per hour = 116,702,206 kWh (or 116,702 megaWatt hours).

Using the same emissions equation as before (x 1.07kg), this tallies up to 124,871 kg of equivalent CO2. In other words, to cool, and dehumidify, the gallery spaces for the *In the Balance* exhibition produces nearly 125 tonnes of gases – gases which will, in time, make the planet even warmer.

And finally... if we now add up the lighting + electricity + air conditioning, we get a total greenhouse gas emission of 141,239kg.

This figure does not take into account:

- manufacturing of the artworks
- building walls
- special events during the run of the show
- production of the catalogue
- installing and taking down the show
- any other emitting events I can’t currently call to mind

It is only for air conditioning and lighting to keep this single exhibition, on one floor of the museum, up and running during the 72 days it is scheduled to be open to the public.

What to do with all this information? I really don’t know. But right now, I am going to leave this all aside for a moment, and go listen to some AC/DC.

6 RESPONSES TO “THE BOTTOM LINE?”

IAN MILLISS SAYS:
September 30, 2010 at 2:26 pm

If you were looking at it in a cost accounting mode, you would also have to allocate a fixed overheads component to account for energy usage by the admin area of the building; i.e. work out what proportion of the MCA’s total exhibition space is being taken up by this exhibition then add that proportion of admin. area energy usage for the time of the exhibition. This is rough, but it would notionally account for energy usage in relation to the exhibition by admin both before, after and during the exhibition. So, you better get up to admin, bookshop, etc now and do all that again for all the non-exhibition areas.

LUCAS SAYS:
September 30, 2010 at 2:51 pm

No rest for the wicked, eh Ian?

LOUISE SAYS:
October 2, 2010 at 11:09 am

The maths hurts my brain, but wow.

JACK NICHOLSON SAYS:
October 3, 2010 at 3:30 pm

And what about the poo and the water to flush it? Meaning bodily functions – not the art.

LUCAS SAYS:
October 3, 2010 at 3:43 pm

Indeed.

I need to move onto waterworks now, don’t I?

JACK NICHOLSON SAYS:
October 4, 2010 at 1:41 pm

Lucas, yes. Unfortunately, I think it’s the realm of uncharted waters you now need to cross. While this domain is often overlooked and still considered a taboo, everyone does indeed poo. And there’s nothing really environmentally-friendly about it. I wonder where all of the MCA’s poo goes? I’m sure they have collected a lot of it over the years.
The artist is sensitive and cares about the world. The artist wants to communicate her concerns and so she makes a work that expresses her position on environmental devastation. It hangs on a gallery wall and the artist feels satisfied. The work attracts positive press, gets reviewed favourably on some high-profile blogs and, as a result, a well-known gallery director asks the artist to lunch. Late nights of work and self-doubt, early mornings of work and self-doubt, are all, ultimately, worth it.

The artist has two jobs. She needs these to survive in the city. (Cities are responsible for 75% of greenhouse gas emissions.) The artist is always tired and, three times a day, she drinks New Zealand wine (about 23,196 food kilometres). Was the work her work (approximately 23196 food kilometres)? The artist has two jobs. She needs these to survive in the city. (Cities are responsible for 75% of greenhouse gas emissions.) The artist is always tired and, three times a day, she drinks New Zealand wine (about 23,196 food kilometres). Was the work her work (approximately 23196 food kilometres)?

So what’s my role in all this, then? Art, as we have come to know it, often prioritises ends over means, resulting in some pretty wasteful practices in the name of a spectacular outcome, Ihlein says. ‘Sustainable’, unfortunately, has become one of those words that’s repeated so often it’s almost meaningless, he continues. ‘However, I believe that it’s in the nature of humans to make art (of all sorts). It would be ridiculous to try and “abolish” culture altogether as an extreme method of saving the planet.’

‘I’m not a proper, bona-fide Environmental Auditor, Ihlein declares. “There are trained professionals out there who can do a much better job than me at tallying up all the carbon emissions of the museum’s operations. So what’s my role in all this, then? I’m an enthusiastic amateur, ordinary bicycle riding, compost-making suburban do-gooder. I’ve installed a half flush toilet, I use energy-saving bulbs, “safe” toilet paper and I’ve signed up to “green power”, but I don’t really understand whether I’m making any difference at all, or just helping myself feel marginally better’.

The Community Centre in the town where I live recently engaged CRAG, the Carbon Rationing Action Group, to do an environmental audit on its building and energy consumption. A few weeks later, the report, which the centre will use when applying for sustainability grants, was sent through. Have you seen the report? Have I? Has anyone in my community? Although CRAG is a collective of bona-fide environmental auditors, their report has been relegated to a filing cabinet. But had an artist done it, however creatively, I’m guessing more people would have seen it and taken a keener interest.

In all this appraising and questioning really worth it? Are we really accountable for our own polluting, or just for the guilt associated with it? Does being accountable mean that we must take responsibility for our own actions, or that we are morally answerable to others? To whom? The government? The next generation? Our neighbours who spy us throwing out our green waste instead of composting it? The government? The next generation? Our neighbours who spy us throwing out our green waste instead of composting it?

On Ihlein’s blog I found this quote about environmentalists by inventor Dr. Saul Griffith: ‘I know very few environmentalists whose heads aren’t firmly up their ass. They are bold-facedly their ass. They are bold-facedly”
hypocritical and I don’t think the environmentalism movement as we’ve known it is tenable or will survive. Al Gore has done a huge amount to help this cause, but he is the No.1 environmental hypocrite. His house alone uses more energy than an average person uses in all aspects of life, and he flies prodigiously. I don’t think we can buy the argument anymore that you get special dispensation just because what you are doing is worthwhile.

Is that what Al Gore is doing, exempting himself because he is championing an important cause? Is that what the artist is doing, ignoring her way of life because she has created important work?

It used to be that the artist merely had to create a work that was powerful or quiet or subversive or provocative or beautiful, in order to make a difference. It used to be that the ex-vice-president-turned-public-speaker merely had to give a presentation that inspired, in order to reused. It used to be that the writer merely had to write an article that exposed something true in order for people to react.

Now we’re prioritising their everyday lives as much as their work. I wonder, is this just another rung on the ladder of celebrity culture, a move that’s akin to going through a rubbish bin outside a Hollywood mansion? Or is it a step towards dismantling such a culture, a culture that elevates people to hero status, regardless of the way they live?

When I asked Ihlein if, at the close of the In the Balance show, he would be decreeing a verdict, either yay or nay, as to whether the show was worth it, he said no, he wouldn’t be, and I was glad. It means his audit is not about having a final say, about reaching one definitive conclusion, but about highlighting our methods and processes, our ability to speculate and to question, and our obsession with cultural objects that for too long we have prized, but not prised open.

Environmental Audit – The Bottom Line?

This article was originally published in Trouble Magazine, October 2010.

Meg Ulman is the co-author of the AHIA nominated environmental memoir The Art of Free Travel (NewSouth, 2015). Meg facilitates Culture Club, a fermenting group that meets monthly on Dja Dja Wurrung country where Meg lives with the other members of the neo-peasant collective Artist as Family, www.theartistasfamily.blogspot.com
ABOUT LUCAS

Lucas Ihlein is an artist and a researcher at University of Wollongong. Prior to conducting Environmental Audit, Lucas spent several years developing a method of blogging as a form of art, through projects like Bilateral Petersham (2006) and Bon Scott Blog (2008). Since completing the Audit, Lucas has continued to explore the relationship between socially engaged art and the world of environmental management. Key works include The Yeomans Project with Ian Milliss (2011-14); Green Bans Art Walk with Big Fag Press and The Cross Art Projects (2011); and Sugar vs the Reef? with Kim Williams and Ian Milliss (2014-15).

Documentation of all these projects is available at http://lucasihlein.net

ABOUT IN THE BALANCE

Environmental Audit was an integral part of the exhibition In the Balance: Art for A Changing World at the MCA Sydney, from August to October 2010. The show was curated by Glenn Barkley, Anna Davis, Rachel Kent, and Keith Munro. Artists exhibiting included Artist as Family (Patrick Jones, Meg Utian and Zephyr Ogden Jones), Badger Bates, Lauren Berkowitz, Diego Bonetto, Andrea Bowers, Dadang Christanto, Bob Connolly, Georgia Curry, Lorraine Connelly-Northey, Nici Cumpston, Peter Dombrovskis, Bonita Ely, Euraba Artists & Papermakers, Dan Allende (Futurefarmers), Jeanne Van Heeswijk, Lucas Ihlein, Lyndal Jones, Yvonne Koolmatrie, Janet Laurence, David Mackenzie, James Hewitt, Mavis Ngallametta, Susan Norrie, Raquel Ormella, Cecilia Peter, Frank Petero, Catherine Rogers, Paul Sixta, David Stephenson, Joni Taylor, theweathergroup_u, Angela ‘Mahnah’ Torenbeek, Olegas Truchanas, Tessa Zettel & Karl Kohe.