Références

- *Ecomapping, qu'est ce que c'est ?*, mis à jour en 2011. https://www.ecotoolkit.eu/ecomapping.php?lang=fr_FR, site consulté le 18 septembre 2020.
- *Institut royal des Sciences naturelles de Belgique*, mis à jour en 2013. http://www.irismonument.be/fr.Bruxelles_Extension_Est.Rue_Vautier.29.html, site consulté le 15 septembre 2020.
- *Label Entreprise Ecodynamique*, s.d. https://www.ecodyn.brussels/, site consulté le 20 septembre 2020.
- Lebon J., *Histoire d'un couvent jamais occupé devenu un prestigieux musée*, Ixelles, Cercle d'Histoire locale d'Ixelles, 1999
- Vivé A. & Versailles A., *Du Musée à l'Institut – 150 ans de Sciences naturelles*, Bruxelles, Institut royal des Sciences naturelles de Belgique, 1996
- Thunberg G., *No One Is Too Small to Make a Difference*, London, Penguin Books, 2019.

Christine Dupont, Curator, House of European History
Lionel Devlieger, Project manager, Rotor
Michael Ghyoot, Project manager, Rotor

The trap of a 50t bouquet. Guidelines for procuring a circular exhibition

This text tells the story of an exhibition that has not happened yet. It focuses on the early steps of a vast project that will open its doors in Brussels in the fall 2022. Some elements presented here have not yielded any result yet.

The exhibition in question will be hosted by the House of European History (HEH), a relatively young museum (2017) dedicated to the history of Europe. It will tackle the question of waste.

All around the planet, museums are reflecting about the best ways of contributing to the global thinking and acting for a better future[57].

For a museum curator, arguably the most obvious contribution is to make an exhibition on climate change. But what would this mean for a museum dealing with European history ? In other words, what does the past tell us about the current situation and what is Europe's place (responsibility ?) in an issue which is global? And how to display the action of women and men on their environment in a history museum?

The HEH has come to the idea to focus on one of the very material dimensions of the environmental issue : rubbish. This is of course a very popular topic in museums. Each institution has its individual approach : ethnographical, artistic, scientific, archaeological, for very different kinds of exhibitions in various sizes and types of display[58]. Nevertheless, the project team considered there was still place for a historical approach, taking into consideration the various speeds and approaches taken by European societies towards waste, mainly from the Industrial Revolution. Briefly put, this exhibition will open up with a foreword interrogating the revealing power of waste and then focus on two main historical eras: the Industrial era before and after waste became an issue and the post-war "throwaway Europe" (until today). This is an opportunity to reflect on individuals' and societies' relationship with waste, with all the depth and nuances of history and geographical/cultural differences. This experience will offer interesting possibilities of intergenerational interactions between visitors. After all, throwing away is something recent in history.

[57] See for example the Bremerhaven Declaration on the Role of Museums in Addressing the Climate Crisis https://www.klimahaus-bremerhaven.de/fileadmin/Veranstaltungen/Internationales_Symposium_2020/Bremerhaven_Declaration.pdf

[58] To name just some examples of exhibitions on this theme : *Vies d'Ordures*, MUCEM, Marseille, 2017 or *Disposable ? Rubbish and us*, British Museum, London, 2019-2020.

As put by Mark Miodownik, "for most of history it - a culture of disposability - would have been regarded as a sign of madness. Materials were expensive, cups were valuable, and to throw something away after only one use was the road to poverty and ruin."

Operation Rubbish. Histories of Waste (working title) is actually much more than an exhibition. It combines a local participatory collaboration with waste field workers and activists in Brussels with the development of a history exhibition. It also includes a partnership with a dozen of museums across Europe and the development of an online platform which is the virtual prolongation of the material exhibition presented in Brussels. All content and activities will therefore be accessible from all over Europe and beyond. In this article, however, we will focus on the exhibition in its very materiality.

Developing an exhibition about waste might be said to to blur the border between the message and the medium. The pitfall of saying something and doing something else was too big to be ignored. It quickly became clear that this exhibition was an excellent opportunity to rethink the way temporary exhibitions are usually designed, constructed, and disposed of.

It is in this context that the HEH sought assistance from Rotor, an organisation active in reuse since 2005. While Rotor's expertise is mostly on reclaimed building materials, the organisation has also carried out a number of exhibition projects in different contexts. The present text is a combined effort of three people and reflects the early stage of development of the project.

In this case, the general context in which the HEH operates should be taken into consideration. The museum is in fact a unit of the European Parliament. Since it deals with relatively large budgets of public money (in the case of this exhibition, about 1 million euros), the museum has to comply with the strict public procurement regulations. In practice this means that a design and build contract for temporary exhibitions is normally the most convenient solution. It allows the HEH to have one contract for the conception, build, maintenance and dismantling of the exhibition.

The collaboration between Rotor and the HEH brought about an interesting mix of a research driven perspective on waste combined with practical strategies to integrate circular considerations into public procurement. In this text, we mostly focus on the practical solutions that we have developed to encourage tenderers to propose ambitious circular strategies for the project.

ENVIRONMENTAL AND CIRCULAR PERFORMANCES IN CALLS FOR TENDERS

For non-lawyers, calls for tenders and technical specifications can be intimidating and dispiriting; hence they are more often copy-pasted from one project to the next than profoundly altered at each iteration. Yet these documents provide great leverage if one is to shape established practice towards greater sustainability. Contracting authorities can use them to require tenderers to come up with new solutions and explore alternative ways. This aspect is often put forward in the literature on public procurements. Yet, these tools have their own requirements.

Beside the imperatives of transparency, equality of treatment and publicity (which are basic requirements set by regulation), they have their own logic and ways of working.

They call for coherence. Any logical contradiction can result in possible appeals from unsuccessful tenderers. This coherence also concerns the adequacy of the award criteria and the elements presented in the offers received. Ideally, these elements should also be monitored coherently throughout the project implementation.

Public tenders call for realism. If the objectives set in the calls for tenders should be challenging and encourage new approaches, they should also stay in line with the effective capacities of the tenderers. Otherwise, no candidate would submit any offer and the procedure would have to start again.

Finally, calls for tender should strive for a subtle balance between the work required by the tenderers in the application phase and the reward of being awarded the contract. To put it bluntly, if the price of applying is not worth paying, there will be no tenderer.

In this context, how can you express your desire for high performances in terms of sustainability and durability ? This was the main question we tackled in the project.

THE NATURE OF AN EXHIBITION PROJECT

In current practice, most often, commissioned exhibition scenographies are approached like traditional building projects, almost as if the museum was commissioning the building of a house inside its own facilities. That built structure (the price of which sometimes indeed approaches that of a newly built home), is supposed to be both functional (meeting all specifications defined by the commissioner) and aesthetically appealing. Located inside the museum space, and paid for by that institution, even if built by a third party, it is also naturally thought of as a property of the museum.

The fact that the life-span of this structure is (in comparison with a typical building) very short (one year in the case of the HEH's temporary exhibitions), is usually not so much taken into consideration. Yet, at the end of the exhibition cycle, the structure suddenly becomes an embarrassing presence for the institution which, chronically short of storage space, is eager to see it disappear. One therefore hires the services of an external operator - often the contractor who built it in the first place - to tear it down and remove the debris swiftly and at the lowest cost, providing applicable regulations on waste management are respected. Initiatives to salvage something useful from the debris hinge on individual commitment and therefore always remain small scale.

In this framing, the push for reducing the environmental impact of the built is often translated as a need for picking the materials that compose it with greater care.

LIFE CYCLE ANALYSIS

Nowadays, the main method to assess the environmental impact of a material good is the Life Cycle Analysis (LCA). This method analyses each step in the life cycle of a material or component, from the extraction of the raw materials to the disposal after use. For each step, the method accounts for all the inputs (materials, energy...) and the collateral outputs (pollutions, waste, greenhouse gases emissions...) along the production process. The method allows for the expression of the combined environmental impacts of the component, to climate change (emissions of CO_2 and other greenhouse gases), water eutrophisation, ozone depletion, toxicity on human health, etc. The LCA "score", thus calculated for each separate component, can then be aggregated to express the global environmental impact of the final assemblage - in our case a scenography.

LCA's are powerful tools to compare different solutions meeting the same requirements, for instance two versions of a chair design. However, they require an intensive inquiry to examine each step of the production process of just one single component, say the screws used to fix plasterboard to a stud wall. The inquiry should then be repeated for the tens or hundreds of other components included in the build. Such a process, if justifiable for the analysis of a good produced in series, like the industrially manufactured chair, would be hopelessly expensive for a uniquely designed, singly-use construct such as a built exhibition.

Tables, with pre-calculated LCA's for typically used materials, such as plasterboard, screws and timber studs, offer some relief. Yet, these - as always is the case in an LCA - are based on hypotheses and assumptions that don't necessarily fit the particulars of a given project. In the best case, they can provide a long list of "rather

good" materials, the use of which is to be encouraged (FSC-labelled solid timber, water-based paint with natural pigments...) vs. "rather bad" materials (PVC, aluminum...), that need to be shunned. But calculating an overall LCA-score, in the context of a tendering procedure for a design and build commission, will always be tremendously tedious. For the bidder, it may lead to stifled creativity, resulting in stereotyped solutions that have been calculated before. For the tenderer, it leaves them the responsibility of sifting through and controlling or (dis)trusting the numbers put forward by the bidder.

In addition there is a further complication. Typically, an LCA makes assumptions about the life cycle of a component. Imagine two types of asphalt roof-covers. One of which is expected to last for 20 years, the other that lasts only for 10 years, all other impacts being equal. It is clear that the environmental impact of the latter will be double that of the former, because it will need to be replaced once more for the same time-span.

Now, in a set design, most components that make out the built are durable enough to last far beyond the expected life-span of the exhibition. So the life-cycle of most components is just cut short abruptly. Short life-cycles can be integrated in the LCA calculation, but then imagine that one of the components, say a digital video projector, will afterwards be used once again for another exhibition of the same duration. It is clear then that the LCA-impact of that projector, for both exhibitions, is reduced by half; even more so if it is reused again after that. This reasoning is applicable to many other potentially reusable components. So, exerting leverage on what will happen with the components of a scenography after their first use appears to be of crucial importance. This is where well drafted specifications and a simple assessment mechanism can make the difference.

[53] Walter R. Stahel, The Circular Economy. A User's Guide, p. 1.

DEFINITION OF CIRCULAR ECONOMY

Taking these considerations on-board, and using them to lower the overall environmental impact of a scenography boils down to thinking along the lines of the circular economy.

In essence, the logic of the circular economy is to lengthen the useful life-cycle of goods and materials. The circular economy typically relies on professional activities which create value by preserving goods : maintenance, cleaning, restoring, refitting, repairing or reusing existing materials. This model explicitly diverges from the 'linear' economy, in which the value depends on an increased production and consumption of goods - also resulting in increased pressure on the environment and waste production.

An economist such as Walter Stahel, founder of the Life Cycle Institute and a frontrunner of the notion of circular economy, puts it like this:

> "The circular economy always had the objective to optimise the use of objects, not their production; to preserve the use value of objects, components and molecules at their highest utility and value levels; and to profitably manage these stocks in competition with other economic options."[53]

The practices proper to the circular economy may affect the way ownership is considered. In the linear scheme, ownership is transferred together with the sale of the good. Manufacturers and sellers see their profits increase if they can produce and sell more goods. Hence the appeal of shorter life-cycles which lead to increased profits, but call for higher replacement rates and thus have a higher impact on the environment. In the circular economy however, manufacturers are invited to sell leasing schemes. The idea being that if producers are equally responsible for taking back the goods they produced after a cycle of use they will be encouraged to design them as resistant, durable and perennial as possible, so that the same good can live through several cycles of use, generating income at each of these.

TRANSLATING THE CIRCULAR ECONOMY LOGIC TO SCENOGRAPHY SPECIFICATIONS

We took these considerations on board when drafting the call for tenders of the exhibition and setting the few rules by which the offers were to be assessed.

One parameter we placed centrally in the methodology was weight. The amount of material used in the design is monitored by its expected weight, whereby the first rule is : (Rule n° 1) the lighter the better. This aspect is in line with the prevention principle: the best waste is that which is not produced.

Next we require the bidder to identify, in the materials and elements of the proposed design, three very simple categories : circular materials, semi-circular materials, and linear materials, and to calculate the proportional weight of each of the three categories.

The categories are :

1. Circular elements : elements of which the use-value is fully preserved in successive uses.
2. Semi-circular elements: elements of which the use-value is lowered in case of a subsequent use, as is typically the case in recycling whereby the materials of the original component undergo heavy transformation (crushing, melting, etc.).
3. Linear elements : single-use, disposable elements, or elements discarded as waste with low-grade recovery (downcycling, incineration, landfilling...).

The implicit rule here (Rule n°2) is : fully circular is better than semi-circular, which is better than linear.

What is perhaps remarkable is that the assessment of what fractions are either linear, semi-circular or fully circular needs to be made twice, once for the flow of materials entering the scenography, and once for the outgoing flow.

Indeed, one can have for instance a newly bought material (new timber, newly bought electronic equipment...), that enters the scenography as part of the linear fraction but exits the scenography at the end of the exhibition's life-cycle as a reusable material. Conversely, a material such as particleboard made from recycled solid wood waste is typically trashed for incineration after use as it is unfit for recycling into new particleboard. Such an element will thus be part of the semi-circular fraction for the ingoing stream and part of the linear fraction for the outgoing stream.

- Typical fully circular materials entering are : rented elements, materials from the Contractor's own stock of reusable elements (modular scenography elements used in successive exhibitions, dismantled and refurbished materials), elements purchased from professional second hand building materials dealers, etc.
- Typically semi-circular materials entering are : commercially available materials with a high recycled content, off-cuts from industrial production, overstocks, etc.
- Typical fully circular materials exiting are : rented materials which are returned to their owner who ensures their next use(s), materials that are sold on the second hand market, materials that are donated to third parties with the purpose of reuse, materials that are carefully reclaimed and stored by the operator with the purpose of reuse.
- Outgoing semi-circular materials are materials and equipment that are taken back by a producer or a third party ensuring high-grade recycling.

This attention to the outgoing flow of materials could be summarised as a third rule (Rule n°3) : anticipate future uses. The bidder is actively encouraged to take a stance with bad -trashing- habits.

This means the bidder/operator is actively encouraged to design connections that allow for easy disassembly and the recovery of the full use value of the components. Recovering the full amount of the fir studs in the example for reuse is only possible if the connections are reversible, while the design avoids cutting the studs in too many short bits.

It also prevents the design of ultra-specific objects, which are tailored to one exhibition but have no future afterwards.

Most of all, this consideration fosters the possibility of an important transition in the business models of the contractors who usually carry out the design and build of such exhibitions.

AWARDING AND MONITORING

The principles set in the call for tenders will be translated into an award criterion (among other criteria used to evaluate the offers). A simple table will be used to assess the circular score of each exhibition project. Awarding a higher number of points to scenographies with higher fractions of Circular and Semi-Circular elements, it translates Rule number 2 into a quantitative score.

	10%	20%	30%	40%	50%	60%	>60%
Fully circular	10 pt	20 pt	30 pt	40 pt	50 pt	60 pt	75 pt
Semi Circular	5 pt	10 pt	15 pt	30 pt	25 pt	30 pt	40 pt

An example might make this a bit more tangible.

Imagine a simplified scenography that exists of a wall composed of 100 m² of 10 mm thick particleboard, and 220 meter of 4,5 x 4,5 mm studs in solid Northern White Fir.

The density of the particle board is about 500 kg/m³, the 100 m² weigh 500 kg.

The density of fir is about 450 kg/m³; the 220 meter will weigh (0,045 m)² x 220m x 450 kg/m³ = 200 kg.

Now, what is the planned origin and expected destination of these materials ?

Description of the batch	Weight (kg)	In	Out	Comment
100 m² of 10 mm particleboard	500	Semi circular	Linear	Material with recycled content. Will be trashed afterwards.
220 m of 45 x 45 mm Fir studs	200	Linear	Fully Circular	Bought new. Commitment to reuse it afterwards.

These two fictional batches would thus get a score of :

Linear : (200 + 500 kg)/1400 kg = 50 % –› 0 points

Semi-circular : 500 kg/1400 kg = 36% –› 15 points

Fully circular : 200 kg/1400 kg = 14% –› 10 points

Total : 25 points.

Now imagine that solid fir rafters go to waste at the end of the exhibition. Then :

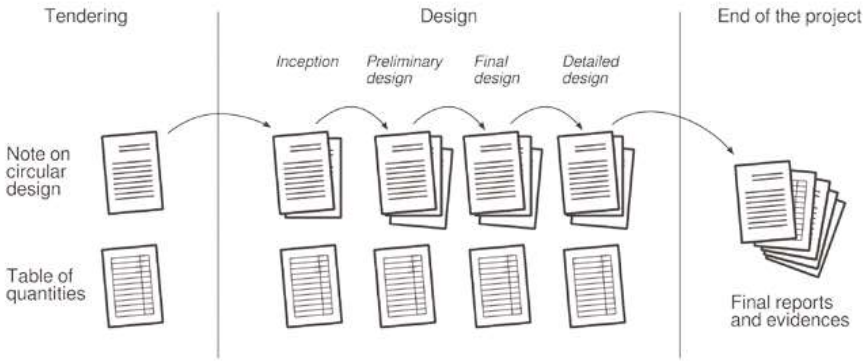
Semi-circular : 36% –› 15 points

Fully circular : 0% –› 0 points

Total : 15 points.

The comparison between different options and offers is possible. But not only that. For the selected candidate, the targets to which they committed in their offer will become contractual.

In practice, the table of targets (Table of quantities) will be updated at each important step of the project by the operator, together with a note on circular design, in which the approach is explained. The very last slice of payment will be conditioned to the production of a small report demonstrating that expected circular solutions for outflowing components are effectively happening. To attest to this, contractors will be required to present evidence such as sale bills or pictures of the component neatly stocked to be reused.



A NEW OWNERSHIP SCHEME

While developing these incentives to encourage operators to take responsibility for the circularity of their set-design, we realised that one of the biggest hurdles potentially was the question of ownership. As mentioned earlier, exhibitions are, most of the time, legally thought of as property of the commissioning museum, since the museum has paid for it (even if that property becomes an embarrassing presence once the exhibition has come to an end). A simple solution consists of abandoning that ownership, which the HEH agreed to do on this occasion. What is of importance for the museum is the service provided by these goods, not so much the fact of owning them. If ownership remains in the hands of the operators, there is a far bigger latitude for recirculating elements. Companies can invest in high quality, robust electronic equipment that can live through multiple cycles of use, it can reclaim, store and reuse modular construction elements, from one exhibition to another, etc.

Views of the exhibition Underground in the City at the Ghent City Museum (STA.M), co-curated and designed by Rotor, 2019.

NEW MODES OF APPRECIATION

A successful exhibition is felt by the public as a gift, a finely crafted installation in which the care taken by the curators, designers and builders to make it a unique experience is intimately felt as genuine. Under the regime of linear production, this gift-like quality usually translates into an "impeccable finish", as one would expect in high-end real-estate. Surfaces are lacquered with glossy paint to the point that joints between the boards constituting them become invisible, glass hoods in triple glazing are custom-made to contain exactly the shape of a specific object, etc. The feeling of "being taken care of" that the visitor undergoes, consciously or unconsciously, when looking at such features, is important. It is the equivalent of receiving a flower bouquet, and should not be overlooked in efforts at "greening" exhibition making. Yet, if one is to make the transition to more circular scenographies a reality, one should work at disconnecting the "gift-feeling" from the consumption of tremendous quantities of virgin materials; the trap of the 50-ton bouquet. We believe the paths to realising such a disconnect are diverse. Using reusable structural modules, covered with a lightweight, single-use membrane that makes out the visible, finely crafted skin of the scenography is one option, but there are others available.

For a 2019 exhibition on the urban underground Rotor designed for the museum of the city of Ghent (STA.M), it was decided to use as tables the raised floor systems used in contemporary office spaces, including the carpet tiles. The setup hinted at the above vs. below ground logic thematised in the show. It was built up with systems salvaged from an office building slated for demolition in Brussels, and was returned, afterwards, to the second hand-circuit that exists for these floors.

Ultimately, the circular economy is aiming at substituting the use of energy and natural resources for labour, crafts and know-how - of which the world of exhibition making is abundantly endowed. We used the call for tender to challenge the bidders to draw on these rather immaterial resources so as to provide the visitors with a rich and meaningful experience, all the while preserving the environment. We hope the result will live up to our expectations.

Lionel Devlieger et Michaël Ghyoot

Rotor et l'économie circulaire dans le secteur culturel

Views of the exhibition Underground in the City at the Ghent City Museum (STA.M), co-curated and designed by Rotor, 2019.

Depuis sa création, l'association Rotor s'intéresse au réemploi des flux de déchets et de matériaux, y compris dans le secteur culturel. Cet article retrace brièvement quelques jalons importants de cette trajectoire.

2005. Le projet Rotor naît autour de l'idée de répertorier dans une base de données des surplus et des déchets de production industriels. Cette liste de matériaux est destinée à des designers invités à s'en servir pour développer "des produits sensés et attirants". Ce travail prend forme autour d'un workshop intitulé *Looplab*, mis en place par Maarten Gielen et Tristan Boniver durant 3 jours à Bruxelles dans le cadre du festival *Basurama B.*

2006. Le projet aurait pu s'arrêter là mais la volonté de continuer à cartographier les déchets industriels reste vive chez le duo d'initiateurs. Rejoints par deux nouveaux membres, ceux-ci fondent une asbl dans ce but. Bientôt, celle-ci se met à explorer plus largement la thématique des déchets. Elle fait alors le constat que les logiques de prévention (y compris par le réemploi), bien qu'elles soient explicitement préconisées par la réglementation, restent minoritaires en pratique. Ce sont surtout les logiques de recyclage qui sont dominantes et ce tant pour les déchets ménagers que pour les déchets industriels - d'ailleurs nettement moins visibles. C'est dans ce domaine que Rotor mène ses investigations, en multipliant les visites d'entreprises et de centres de traitement des déchets.

2008. Le projet d'une base de données open source des déchets potentiellement utilisables n'a pas décollé. En revanche, nous nous sommes graduellement spécialisés dans l'économie matérielle du secteur du bâtiment en nous forgeant une meilleure connaissance du domaine des déchets de construction et de démolition (C&D). La perspective initiale reste identique : lever les obstacles au réemploi de matériaux de construction. L'action de l'asbl pour atteindre cet objectif prend des formes diverses : conception de projets pilotes, missions de conseil (y compris aux pouvoirs publics), recherches historiques, enseignement, conférences... L'équipe s'élargit graduellement, avec des membres aux profils divers (architectes mais aussi ingénieurs agronomes, juristes, journalistes, experts en sciences sociales, etc.).

2011. Nous obtenons une subvention des pouvoirs publics bruxellois pour effectuer un recensement des fournisseurs professionnels de matériaux de construction de seconde main. Celui-ci prend la forme d'un annuaire en ligne (Opalis.eu) basé sur une longue série de visites et d'interviews. Le site présente en détail les principaux produits et services proposés par chaque entreprise. À l'origine consacré aux opérateurs situées à moins de 100 km de Bruxelles, l'annuaire s'élargit progressivement à tout le territoire belge (puis, à partir de 2018, à la France et aux Pays-Bas).