

Klaus Ulrich Werner

Sustainable buildings, equipment, and management. A checklist¹

Održive zgrade, oprema i menadžment. Kontrolna lista²

Originalno izdata: The Green Library = Die grüne Bibliothek. The challenge of environmental sustainability / ed. on behalf of IFLA by Petra Hauke, Karen Latimer and Klaus Ulrich Werner. München/Boston: De Gruyter Saur, 2013. VIII, 433 pp., ill. (IFLA Publications, 161) ISBN 978-3-11-030972-0. Abstrakti su dostupni na: <https://www.degruyter.com/document/doi/10.1515/9783110309720/html>

Klaus Ulrich Werner
Freie Universität Berlin, Philologische Bibliothek
klaus.werner@fu-berlin.de

For any construction project, just as for any complex undertaking in general, a checklist provides a useful means of confirming that everything has been considered. Although it cannot claim to be exhaustive, the following list of aspects of planning, construction, and also library operation, is designed to help ensure that everything has been considered.

Za svaki projekat izgradnje, kao i za svaki složen poduhvat uopšte, kontrolna lista obezbeđuje korisna sredstva kako bi se utvrdilo da je sve uzeto u obzir. Mada se ne može tvrditi da je iscrpna, sledeći spisak aspekata planiranja, izgradnje kao i rada biblioteke, kreirana je tako da se osigura da je sve uzeto u obzir.

1 Planiranje projekta, finansije

- Rane diskusije o održivim ciljevima sa klijentom i uspostavljanje kriterijuma
- Osećaj o smeru u kojem se definiše "zelena zgrada": ekonomično, ekološki korektno, čuvanje resursa. Visok nivo komfora za korisnike, zdrava životna sredina sa optimalnom integracijom u njihovo sociokulturno ili u komšijsko okruženje.
- Utvrđivanje ekoloških ciljeva sponzora ili klijenata
- Preliminarno razmatranje ekološkog

1 Project planning, finance

- Early discussion of sustainability goals with the client and the establishment of criteria
- A sense of direction on the definition of a 'green building': economical, environmentally friendly, resource saving. High level of comfort for users, a healthy environment with optimal integration into their socio-cultural i. e. neighbourhood surroundings.
- Establishment of the environmental goals of the sponsors or clients
- Preliminary consideration of the

¹ Transl. from German into English by Karen Latimer.

² Prevela sa nemačkog Olivera Nastic.

balansa zgrade, izgradnje, funkcionisanja, održavanja, rušenja i odlaganja, balansa CO₂.

- Ciljevi za obračun troškova funkcionisanja
- Sveobuhvatno razmatranje ROI (Return-on-Investment)
- Troškovi životnog ciklusa
- Kreiranje spiska održivih želja
- Razmatranje povećanja vrednosti imovine (kroz sertifikovanje)
- Razmatranje moguće finansijske podrške

2 Tenderi (ponude)

- Javni sektor bi trebalo da bude uzor, posebno za edukativni i kulturni prostor kao što je biblioteka
- Formulisanje specifičnih kriterijuma u cilju održivosti
- Definisane ekološkog otiska biblioteke
- Deklaracija o specifičnim ciljevima zaštite životne sredine
- Zahtev za holistički pogled na pitanja održivosti
- Verifikacija sertifikata

3 Mapa/Lokacija

- Ekološki kriterijum koji se odnose na imovinu i njeno okruženje (posledice zagađenja, klimatski uslovi, emisije gasova, buka)
- Resursi koji se se koriste prilikom izgradnje
- Infrastruktura (veze sa javnim prevozom)
- Pristup (kao i troškovi za rasčišćavanje lokacije i održavanje)
- Mesta za lični prevoz (bicikli)
- Ozelenjavanje lokacije i okoline
- Optimizacija lokacije specifičnim građevinskim i energetske konceptom

4 Izgradnja

ecological balance of a building, construction, operation, maintenance, demolition and disposal, CO₂ balance

- Targets for the calculation of operating costs
- Comprehensive consideration of ROI (Return-on-Investment)
- Life cycle costs
- Creation of a list of sustainability desirables
- Consideration of the increase in the value of the property (through certification)
- Consideration of financial support available

2 Tendering

- The public sector should be a role model, especially for an educational and cultural facility such as a library
- Formulation of specific criteria for sustainability
- Definition of the ecological footprint of the library
- Statement of specific environmental objectives
- Requirement for a holistic view of sustainability issues
- Verification of certificates

3 Site / location

- Ecological criteria relating to the property and its surroundings (contamination legacy, climatic conditions, emissions, noise)
- Resource use during construction
- Infrastructure (connections to public transport)
- Access (also costs for site clearance and maintenance)
- Places for personal transport (bicycles)
- Greening of site and surrounding area
- Optimisation of site specific construction and energy concepts

4 Construction

- Infrastruktura: ulazi i izlazi, skladištenje materijala
- Buka i uticaj na životnu sredinu u neposrednom okruženju
- Izbor građevinskih izvođača i opreme iz okoline
- Izrada tendera za izbor materijala i procesi : zahteva kriterijum održivosti i potkrepljuje sa sertifikatom

5 Zgrada

5.1 Struktura

- Održivost kroz kompaktnost ("debele zgrade")
- Ekonomičnost spoljašnjosti / fasada zgrade, pametni dizajn zgrade i zoniranje
- Atrijum kao tipična odlika biblioteka
- Korišćenje ugodnog osećaja za prostor kako bi se minimalizovala upotreba prostora
- Minimalizacija zauzimanja prostora tehnologije u zgradi kroz pametno uređenje
- Minimizaciona korišćenja energije zoniranjem oblasti prema različitim zahtevima svake pojedinačne funkcije biblioteke (uz osvrt na klimatsku kontrolu, svetlo i akustiku)
- Korišćenje krovnog prostora (zeleni krovovi i solarna energija)
- Obimna ušteda resursa kompaktnim skladištenjem (uključujući korišćenje javnih prostora)
- Izgradnja u korist lakog održavanja

5.2 Fasade

- Održiva upotreba fasade (ozelenjavanje, solarna energija)
- Energetski kriterijumi (termalna izolacija)
- Postavljanje prozora
- Strukturna zaštita od direktne sunčeve svetlosti korišćenjem uvučenih prozora
- Upijajuće fasade (duple fasade)

5.3 Građevinski materijal

- Infrastructure: entranceways and exits, storage of materials
- Noise and environmental impact on the immediate surroundings
- Choice of building contractors and equipment from the surrounding region
- Tendering for materials and processes: demand sustainability criteria and take certificates into account

5 The building

5.1 Structure

- Sustainability through compactness ('fat buildings')
- Economic exteriors / building skin, intelligent building design and zoning
- The atrium as a typical feature of libraries
- Using a pleasing sense of space to minimise space use
- Minimizing the space consumption of building technology through intelligent arrangement
- Minimisation of energy use through zoning of areas according to different requirements of each individual library function (with regard to climate control, lighting and acoustics)
- Use of roof areas (green roofs and solar energy)
- Extensive resource saving compact storage (including use in public areas)
- Maintenance-friendly construction

5.2 Facades

- Sustainable use of the facade (greening, solar energy)
- Energy criteria (thermal insulation)
- Window installation
- Structural protection from sunlight using deep lying windows
- Absorbent facades (double facades)

5.3 Building materials

- Ekološki kvalitetan materijal
- Materijali i konstrukcija koji pogoduju dobrom zdravlju (ne-opasni materijali)
- Karakteristike održavanja, servisiranje zgrade
- Trajnost / Dugovečnost
- Popravljivost
- Jednostavnost recikliranja i čišćenja
- Srazmerno korišćenje recikliranih materijala, na pr. aluminijum, čelik

5.4 Klima u zgradi

- Izbegavanje obimnijeg korišćenja klima uređaja
- Diferencijacija klimatskog koncepta u skladu sa funkcijom biblioteke
- Korišćenje betona: temperatura jezgra betona
- Prirodna ventilacija
- Kvalitet vazduha u unutrašnjosti: Sindrom bolesne zgrade: štetni materijali i gasovi
- Ponovno korišćenje vazduha iz sobe za štampanje / kopiranje i provetravanje
- Kvalitetno zastakljivanje (toplotna izolacija)
- Ulaz u biblioteku i unutrašnja klima: okretna vrata, predvorje
- Izbegavanje veštačkog ovlaživanja vazduha
- Solarna zaštita
- Strukturni aspekti solarne zaštite: niski prozori

5.5 Energija, svetlo

- Dnevno svetlo / Veštačko osvetljenje
- Napajanje: udeo električne energije iz obnovljivih izvora energije
- Energetski efikasno grejanje
- Ušteda energije – proizvodnja struje (solarna)
- Učiniti upotrebu energije vidljivom u cilju smanjenja nivoa korišćenja: merači energije

- Ecological quality of the materials
- Materials and construction conducive to good health (non-hazardous materials)
- Maintenance characteristics, building servicing
- Durability / Longevity
- Repairability
- Ease of recycling and cleaning
- Proportion of recycled material used, e. g. aluminium, steel

5.4 Building climate

- Avoid major use of air-conditioning
- Differentiation of the climate concept according to library function
- Use of concrete: core temperature of concrete
- Natural ventilation
- Interior air quality: Sick building syndrome: harmful materials and gases
- Re-use of air from print / copy rooms and air conditioning
- Window glazing quality (thermal insulation)
- Library entrance and interior climate: revolving doors, vestibules
- Avoid artificial humidification
- Solar protection
- Structural aspects of solar protection: low-lying windows

5.5 Energy, light

- Daylight / artificial light
- Power supply: proportion of electricity from renewable energy sources
- Energy-efficient heating
- Electricity saving – electricity generation (photovoltaics)
- Make energy use visible in order to reduce usage levels: energy meters

- | | |
|--|--|
| <ul style="list-style-type: none"> • Toplotni oporavak • Solarna ili geotermička • Javno grejanje • Hlađenje: noćno hlađenje, toplotna aktivacija građevinske strukture • Razmenjivači toplote • Ventilacija: prirodna ventilacija • Postaviti prirodno svetlo u zgradi • Providni materijali za svetlosnu propustljivost • Efikasna kontrola osvetljenja (kontrolne table) • Sistem osvetljenja sa sensorima za pokret • Individualna kontrola osvetljenja za čitalačka mesta • Električni prekidači, takođe za čitalačka mesta • Svetlo po potrebi: prekidači za svetlo, prigušivači za svetlo (dimeri) • Izvor svetlosti (ušteda energije, vek trajanja, recikliranje) • Smanjene upotrebe tople vode • Upotreba tehničke vode i kišnice (toaleti, navodnjavanje) • Funkcije za uštedu vode (toaleti, umivaonik) <p>6 Unutrašnja oprema: izvor, izdržljivost, mogućnosti za čišćenje, recikliranje</p> <ul style="list-style-type: none"> • Podovi i tepisi • Poboljšavanje akustike • Drvo: poreklo, kako je obrađeno, sertifikati • Nameštaj u biblioteci • Kancelarijski nameštaj • Eko ravnoteža • Korišćenje obnovljivih materijala i onih za višekratnu upotrebu | <ul style="list-style-type: none"> • Heat recovery • Solar or geothermics • District heating • Cooling: night cooling, the thermal activation of building structures • Heat exchangers • Ventilation: natural ventilation • Bring natural light into the building • Translucent materials for light transmission • Efficient lighting controls (control panels) • Lighting system with movement sensors • Individual light control of reading places • Electric light switches, also for reader places • Light as needed: step switching, dimmer switches • Light source (energy-efficiency, life cycle costing, recycling) • Reduction of warm water use • Use of grey and rainwater (toilets, irrigation) • Water saving features (WCs, wash basin equipment) <p>6 Interior fittings: source, durability, cleaning capabilities, recycling</p> <ul style="list-style-type: none"> • Floor finishes and carpets • Acoustic baffles • Wood: origin, how cultivated, certificates • Library furniture • Office furniture • Eco-balance • Use of renewable and reusable materials |
|--|--|

komunikaciona tehnologija (Zeleni IT)	communication technology (Green IT)
<ul style="list-style-type: none"> • Potrošnja energije, proizvodnja, recikliranje • Tanki računari umesto PC-a (štedi energiju, duži vek trajanja) • Daljinsko upravljanje • Hardver sertifikat: Energy Star • Štampači: jačina, korišćenje mastila • Utičnice za PC-ije i štampače • Programska rešenja za optimizaciju potrošnje energije (Stand-by) • Smanjenje upotrebe papira, odustajanje radi termalnih papira 	<ul style="list-style-type: none"> • Power consumption, production, recycling • Thin clients instead of PCs (power-saving, longer lifespan) • Remote management • Hardware certificates: Energy Star • Printers: power usage, use of ink • Switchable sockets for PCs and printers • Software solutions to optimize energy consumption (Stand-by) • Reduction in the use of paper, waiver for thermal paper
8 Korisnički servisi	8 User services
<ul style="list-style-type: none"> • Reprografske usluge (skeniranje umesto štampanja), prednost digitalnog, dvostranog štampanja • Info pult (fleksibilni informacioni pultovi korisni kao radna mesta van radnog vremena) • Alternative plastičnim torbama u biblioteci • Kafe u biblioteci: ne-plastično posuđe, roba široke potrošnje itd. • Pozajmljivanje "drugih" neknjižnih materijala: stvari koje nisu potrebne svakodnevno (od laptopova do baštenskog alata) 	<ul style="list-style-type: none"> • Reprographic services (scanning instead of printing), the primacy of digital, double-sided printing • Hot desking (flexible information desks usable as workplaces outside of information desk times) • Alternatives to plastic bags in the library • Library café: china not plastic, Fairtrade products etc. • Lending of 'other' non-book-materials: things not needed daily (from laptops to garden tools)
9 Uprava biblioteke 9.1 Sertifikat za upravljanje životnom sredinom (ISO 14000)	9 Library management 9.1 Environmental management certificates (ISO 14000)
<ul style="list-style-type: none"> • Motivisano i angažovano osoblje • Pravna usaglašenost • Kontinuirani napredak • Odgovornost za održive ciljeve • Transparentnost (javnost) troškova i korišćenja • Prednost konkurencije 	<ul style="list-style-type: none"> • Motivated and involved employees • Legal compliance • Continual improvement • Responsibility for sustainable goals • Transparency of cost and use • Competitive advantage
9.2 Održavanje objekta	9.2 Facilities management
<ul style="list-style-type: none"> • Odvajanja i reciklaža otpada • Firme za čišćenje • Sredstva za čišćenje: ekonomična 	<ul style="list-style-type: none"> • Waste separation and recycling • Cleaning firms • Cleaning materials: economic usage

<p>upotreba</p> <ul style="list-style-type: none"> • Čišćenje ("Zeleno čišćenje": stepenice, sanitarna čvorišta) • Izbegavanje hemijskih proizvoda za čišćenje zgrade • Korišćenje ne-toksičnih proizvoda, baziranih na vodi a ne na uljnoj bazi: ne-parfimisanih, biorazgradivih • Sanitarni materijali (peškiri, itd.) • Recikliranje kontejnera i pakovanja • Recikliranje baterija, električnih uređaja i komponenti • Buka tokom čišćenja – vakum čistači • Korišćenje sijalica • Recikliranje sijalica: neonske i štedljive svetiljke, takođe LED 	<ul style="list-style-type: none"> • Cleaning ('Green Cleaning': floors, sanitary facilities) • Avoidance of chemical products for cleaning the building • Use of non-toxic, water-based rather than oilbased, products; perfume-free, biodegradable • Sanitary supplies (towels, etc.) • Recycling of containers and packaging • Recycling of batteries, electrical devices and components • Noise during cleaning routines – vacuum cleaning • Lightbulb use • Lightbulb recycling: fluorescent and energy saving lamps, also LED
<p>9.3 Kancelarija zelene biblioteke</p>	<p>9.3 The green library office</p>
<ul style="list-style-type: none"> • Zelena nabavka • Zeleni utovar • Korišćenje lokalnih knjigovezaca (smanjenje ugljen dioksida pri transportu) • Kancelarijski pribor i oprema (poreklo, potrošnja energije, recikliranje) • Lokalni dobavljači • Preporučeni dobavljači • Dobavljači i isporučiooci knjiga (smanjenje ugljen dioksida, materijal za pakovanje) • Info pult • Smanjenje upotrebe papira • Digitalizacija arhive • Zeleni kancelarijski materijal • Smanjenje i razdvajanje otpada (papir, plastika, staklo, baterije, digitalni mediji) • Recikliranje štamparskih ketridža • Izbegavanje proizvoda sa otrovnim, štetnim sadržajem ili koje je teško reciklirati • Grejanje koje se može isključiti za vreme odsustva 	<ul style="list-style-type: none"> • Green procurement • Green shipping • Use of local bookbinders (CO₂ balance re transport) • Office supplies and equipment (origin, energy consumption, recycling) • Local suppliers • Certified suppliers • Book suppliers and delivery (CO₂ balance, packing materials) • Hot-desking • Reduction in use of paper • Digital archiving • Green office supplies • Waste reduction and separation of waste (paper, plastic, glass, batteries, digital storage media) • Recycling printer cartridges • Avoidance of products with poisonous, harmful, or difficult to recycle contents • Heating that can be turned down during periods of absence

<ul style="list-style-type: none"> • Oprema kuhinje: uređaji koji štede energiju, energetski-efikasni grejači vode, proizvodi široke potrošnje itd. • Podizanje svesti zaposlenih 	<ul style="list-style-type: none"> • Staff kitchens: energy-saving electrical appliances, energy-efficient hot water production, fairtrade products etc. • Awareness training for employees
<p>10 Strateški ciljevi</p> <ul style="list-style-type: none"> • Transparentnost troškova energije: transparentnost stvara uštedu • Kontrola smanjenja • Dogovoreni ciljevi za uštedu energije • Nagrada i inicijativni programi • Uticaj na poslovne partnere (izdavače, knjižare, dobavljače) • Obraćanje novim ciljnim grupama • Strateško partnerstvo 	<p>10 Strategic goals</p> <ul style="list-style-type: none"> • Transparency of energy costs: transparency creates savings • Controlling for reducing • Agreed targets for energy saving • Reward and incentive schemes • Influencing business partners (publishers, booksellers, suppliers) • Addressing new target audiences • Strategic partnerships
<p>11 Marketing i PR</p> <ul style="list-style-type: none"> • Održivost i korporativni identitet • Moto "Zeleni imidž je dobar imidž" • Biblioteke treba da služe za primer (proaktivna i uzorna) • Privući korisnike biblioteke / korisnike prema održivosti • Privući šire interesne grupe prema održivosti (podrška / finansiranje agencija, Prijatelji biblioteke itd.) • Visoki efekat multiplikatora • Potvrda energetskog učinka se pojavljuje na ulazu u biblioteku (PR) • PR sa i za ekološku aktivnost biblioteke • Saradnja sa sponzorima • Vesti o životnoj sredini, na pr. zeleni odeljak u godišnjem izveštaju 	<p>11 Marketing and PR</p> <ul style="list-style-type: none"> • Sustainability and corporate identity • Motto: "A green image is a good image" • Libraries should lead by example (proactive and exemplary) • Win library customers / users over to sustainability • Win wider stakeholders over to sustainability (supporting / funding agencies, Friends of the Library etc.) • High multiplier effect • The energy performance certificate displayed at the library entrance (PR) • PR with and for the ecological activities of the library • Co-operation with sponsor initiatives • Environmental news e.g. a green section in annual reports
<p>12 Sertifikati</p> <p>12.1 Sertifikati za zelenu biblioteku</p> <ul style="list-style-type: none"> • LEED (US standard)² • BREEAM (UK standard)³ • Green Star Rating System⁴ • DGNB Deutsches Gütesiegel Nachhaltiges Bauen e.V.⁵ • Energieausweis nach EnEV⁶ • European Energy Award®⁷ • Solarbundesliga⁸ 	<p>12 Certificates</p> <p>12.1 Green building certificates</p> <ul style="list-style-type: none"> • LEED (US standard)² • BREEAM (UK standard)³ • Green Star Rating System⁴ • DGNB Deutsches Gütesiegel Nachhaltiges Bauen e.V.⁵ • Energieausweis nach EnEV⁶ • European Energy Award®⁷ • Solarbundesliga⁸

12.2 Upravljanje životnom sredinom	12.2 Environmental management
<ul style="list-style-type: none"> • ISO 14000 (komercijalni, međunarodni, bez pravne prirode) • EMAS (Eco-Management and Audit Scheme) of the EU¹⁰ 	<ul style="list-style-type: none"> • ISO 14000 (commercial, international, without legal nature)⁹ • EMAS (Eco-Management and Audit Scheme) of the EU¹⁰
12.3 Sertifikati o proizvodu	12.3 Product certificates
<ul style="list-style-type: none"> • U skladu sa sertifikatima isključivo nemačkih proizvoda, postoje sertifikati za nacionalne proizvode u drugim zemljama. 	<ul style="list-style-type: none"> • Gütesiegel für Papier (FSC3, PEFC4, IPR5 u. a.) • Der Blaue Engel6 • EU Energie Star7 • u. a. m. • According to specifically German product certificates there are national product certificates in many other countries.

Reference / References

Antonelli, M., & McCullough, M. (eds.) (2012). *Greening Libraries*. Los Angeles, CA: Library Juice Press.

Fachkonferenz der Bibliotheksfachstellen in Deutschland (2012). *Handreichung zu Bau und Ausstattung Öffentlicher Bibliotheken*. Neustadt. www.bibliotheksportal.de/fileadmin/user_upload/content/themen/architektur/dateien/Handreichung_gesamt.pdf (2013/2/19).

McBane Mulford, S., & Himmer, N. A. (2010). *How green is my library?* Santa Barbara, CA: Libraries Unlimited.

Miller, K. (2010). *Public libraries going green*. Chicago: American Library Association.

Wagner, S., & Scherer, J. (2007). Green building management and sustainable maintenance. In K. Latimer & H. Niegaard (eds.), *IFLA Library Building Guidelines: Development and Reflections* (pp. 203–214). München: Saur.

Walker, M. (2009). *100 ways to make your library a little greener*. BachelorDegreeOnline [Blog], April 21. www.bachelorsdegreeonline.com/blog/2009/100-ways-to-make-your-library-a-little-greener/ (2013/3/5).

³ www.fsc-papier.de/ (Letöltés ideje: 2013/2/19).

⁴ www.deutsche-papier.de/de/pefc.html (Letöltés ideje: 2013/2/19).

⁵ www.initiative-papier.de/ (Letöltés ideje: 2013/2/19).

⁶ www.blauer-engel.de (Letöltés ideje: 2013/2/19).

⁷ www.eu-energystar.org/ (Letöltés ideje: 2013/12/30).