

Programa de Planejamento Energético – COPPE/UFRJ

Mestrado e Doutorado em Planejamento Energético e Ambiental

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TÓPICOS ESPECIAIS EM ANÁLISE ENERGÉTICA E AMBIENTAL

COG 859 (créditos: 3,0)

Módulo 1: Avaliação de Ciclo de Vida

(Aulas – 02/10 e 06/11)

1. ACV como instrumento de Análise Ambiental
2. Histórico, Conceitos e Fatores Indutores
3. Métodos

Leitura Obrigatória:

Guiné, J. B. (Ed.). Handbook on Life Cycle Assessment, Kluwer Academic Publishers, 692 p, 2002.

NBR ISO 14040 Gestão Ambiental – Avaliação do Ciclo de Vida – Princípios e estrutura

Aplicações e Estudos de Caso

(Aula – 13/11)

Leituras para Análise por 1 aluno:

Blengini, G. A. Life cycle of buildings, demolition and recycling potential: A case study in Turin, Italy. Building and Environment 44 319– 330, 2009.

Blengini, G. A.; Di Carlo, T. The changing role of life cycle phases, subsystems and materials in the LCA of low energy buildings. Energy and Buildings 42 869–880, 2010.

Muñoz, I.; Canals, L.M.; Fernandez-Alba, A. R. Life Cycle Assessment of the average Spanish diet including human excretion. The International Journal of Life Cycle Assessment 15, 794-805, 2010.

Neto, B.; Dias, A.C.; Machado, M. Life cycle assessment of the supply chain of a Portuguese wine: from viticulture to distribution. The International Journal of Life Cycle Assessment, 18:590–602, 2013.

Pires, A. and Martinho, G. Life Cycle Assessment of a Waste Lubricant Oil Management System. The International Journal of Life Cycle Assessment, Online First, June 2012.

Ribeiro, F.M.; Silva, G.A. Life cycle inventory for hydroelectric generation: a Brazilian case study. Journal of Cleaner Production 18, 44-54, 2010.

Schmidt, W.; F Butt, F. Life Cycle Tools within Ford of Europe's Product Sustainability Index: Case Study Ford S-MAX & Ford Galaxy. Int J LCA 11 (5) 315 – 322, 2006.

Sumper, A.; Robledo-García, M.; Villafáfila-Robles, R.; Bergas-Jané, J.; Andrés-Peiró, J. Life-cycle assessment of a photovoltaic system in Catalonia (Spain). Renewable and Sustainable Energy Reviews 15, 3888–3896, 2011.

Wallbridge, S.; Banford, A.; Azapagic, A. Life cycle environmental impacts of decommissioning Magnox nuclear power plants in the UK. The International Journal of Life Cycle Assessment. Published online, 2012

Leituras para Análise por 2 alunos:

JRC/IPTS – European Commission. Environmental Improvement of Passengers Cars – IMPRO-car. Luxemburgo, 2008.

World Energy Council. Comparison of energy systems using Life Cycle Assessment, 2004.

European Wind Energy Association. Wind Energy – The Fact. Chapter V : Environmental Issues, 2009

Environment Agency. Life cycle assessment of supermarket carrier bags: a review of the bags available in 2006. Report: SC030148, 2011.

The Plastics Division of the American Chemistry Council et al. Life cycle inventory of 100% postconsumer HDPE and PET recycled resin from postconsumer containers and packaging, 2010

European Commission. Life Cycle Assessment of PVC and of principal competing materials, Final Report, 2004

Schmidt, A.; Kloevepris, N.H. Environmental impacts on digital solutions as an alternative to conventional paper-based solutions – Force Technology: Lyngby, 2009.

Módulo 2: Ecologia Industrial

(Aula – 09/10)

1. Definições
2. Princípios, Conceitos e Práticas Internacionais

Leitura Obrigatória:

Graedel, T.E., Allenby, B.R., *Industrial Ecology and Sustainable Engineering*, Prentice Hall, 2010.

Aplicações e Estudos de Caso

(Aula– 27/11)

Leituras para Análise por 1 aluno:

Zhu , Q., Lowe, E., Wei, Y., Barnes, D. “Industrial Symbiosis in China: A Case Study of the Guitang Group”, *Journal Of Industrial Ecology* 11, Special Feature on Industrial Symbiosis, 2007.

Shi, H., Chertow, M., Song, Y., “Developing country experience with eco-industrial parks: a case study of the Tianjin Economic-Technological Development Area in China”, *Journal of Cleaner Production* 18 (2010) 191–199.

Fanga, Y, Cote, R., Qinc, R. “Industrial sustainability in China: Practice and prospects for eco-industrial development”, *Journal of Environmental Management* 83 (2007) 315–328.

Ashton, W. “Understanding the Organization of Industrial Ecosystems: A Social Network Approach”, *Journal of Industrial Ecology*, 12 (2008) 1, 34-51.

Baas, L. *Planning and Unfolding Eco-Industrial Parks: Reflections on Synergy*. China Europa Forum, 2010.

Saikku, L. *Eco-industrial Parks - A background report for the eco-industrial park project at Rantasalmi*, 2006

Sakr, D.; Baas, L.; El-Haggar, S.; Huisingh, D. Critical success and limiting factors for eco-industrial parks: global trends and Egyptian context. *Journal of Cleaner Production* 19 1158-1169, 2011.

Taddeo, R.; Simboli, A.; Morgante, A. Implementing eco-industrial parks in existing clusters. Findings from a historical Italian chemical site. *Journal of Cleaner Production* 33, 22-29, 2012.

Van Beers, D., Biswas, W.K. A regional synergy approach to energy recovery: The case of the Kwinana industrial area, Western Australia, Energy Conversion and Management 49 3051–3062, 2008.

Leituras para Análise por 2 alunos:

Starlander, J., Industrial Symbiosis: A Closer Look on Organisational Factors: A study based on the Industrial Symbiosis project in Landskrona, Sweden, 2003.

Adoue, C. Recherche de synergies éco-industrielles sur le territoire du canton de Genève. Rapport Public – Mars 2006.

ERIN Consulting et al. Hinton Eco-Industrial Park, Eco-Industrial District Zone & EIP Development Guidelines”, Eco Industrial Solutions, December 2005.

Cote, R. P., Considerations in Planning the Kaizer Meadows Eco-Business Park : A report to the Municipality of the District of Chester, 2008.

Van Beers, D., Capturing Industrial Synergies in the Kwinana industrial area, 2007 status report, Curtin University of Technology, 2007.

Módulo 3: Análise energética

(Aula - 16/10)

1. Introdução
2. Definição
3. Origem

Leitura obrigatória:

WILTING, H.C. “An Energy Perspective on Economic Activities”. Tese de Doutorado. Universidade de Groningen, 1996.

(Aula - 23/10)

4. Terminologias
5. Metodologias
6. Aplicações

Leitura obrigatória:

WILTING, H.C. “An Energy Perspective on Economic Activities”. Tese de Doutorado. Universidade de Groningen, 1996.

Estudos de caso

(Aula - 4/12)

Leituras para Análise:

BULLARD III, C.W.; HERENDEEN, R.A. “Energy Impact of Consumption Decisions.” IEEE, Vol. 63, n° 3, March 1975, pp. 484-493.

CHAMBERS, R.S.; HERENDEEN, R.A.; JOYCE, J.J., PENER, P.S. “Gasohol: Does It or Doesn’t It Produce Positive Net Energy?” Science, Vol. 206, n° 4420, November 16, 1979, pp. 789-795.

MACEDO, I.C.; LEAL, N.R.L.V.; RAMOS DA SILVA; J.E.A. “Balanço das Emissões de Gases de Efeito Estufa na Produção e no Uso do Etanol no Brasil”. Secretaria do Meio Ambiente do Estado de São Paulo, 2004.

EAVES, J.; EAVES, S. “Renewable Corn-Ethanol and Energy Security”. Energy Policy 35 (2007) 5958-5963.

REINDERS, A.H.M.E.; VRINGER, K.; BLOK, K. “The Direct and Indirect Energy Requirement of Households in the European Union”. Energy Policy 31 (2003) 139-153.

ORNETZEDER, M.; HERTWICH, E.G.; HUBACEK, K.; KORYTAROVA, K.; HAAS, W. “The Environmental Effect of Car-Free Housing: A Case in Vienna”. Ecological Economics 65 (2008) 516-530.

LENZEN, M.; WOOD, R.; BARNEY, F. “Direct versus Embodied Energy – The Need for Urban Lifestyle Transitions”. Cap. 4. In: Urban Energy Transitions: From Fossil Fuel to Renewable Power. Elsevier. Amsterdam, 2008.

LENZEN, M. “Total Requirements of Energy and Greenhouse Gases for Australian Transport”. Transportation Research Part D4 (1999) 265-290.

NISHIMURA, K.; HONDO, H.; UCHIYAMA, Y. “Comparative Analysis of Embodied Liabilities Using an Inter-Industrial Process Model: Gasoline vs Electro-Powered Vehicles”. Applied Energy 69 (2001) 307-320.

Módulo 4 – Análise de Sustentabilidade Energética: O Nexa com Clima, Água e Terra

(Aula – 30/10)

1. O Conceito NECAT ou CLEW
2. Interações
3. Senso de Escala
4. Estrutura do NECAT
5. O Nexa entre Segurança Energética, Alimentar, e no uso da Água

Leitura obrigatória:

BAZILIAN, Morgan; ROGNER, Holger; HOWELLS, Mark; HERMANN; Sebastian; ARENT; Douglas; GIELEN, Dolf; STEDUTO, Pasquale; MUELLER; Alexander; KOMOR, Paul; TOL, Richard S.J.; YUMKELLA. Kandeh K. *“Considering the energy, water and food nexus: Towards an integrated modeling approach”*. Energy Policy 39 (2011) 7896–7906.

BAZILIAN, Morgan; HOBBS, Benjamin F.; BLYTH, Will; MCGILL Iain; HOWELLS, Mark. *“Interactions between energy security and climate change: A focus on developing countries”*. Energy Policy 39 (2011) 3750–3756.

M. Welsch; S. Hermann; M. Howells; H.H. Rogner; C. Young; I. Rammad; M. Bazilian; G. Fischer; T. Alfstad; D. Gielen; D. Le Blanc; A. Röhrli; P. Steduto; A. Müller. *“Adding value with CLEWS – Modelling the energy system and its interdependencies for Mauritius”*. Applied Energy 113 (2014) 1434–1445

Mark Howells; Sebastian Hermann; Manuel Welsch; Morgan Bazilian; Rebecka Segerström; Thomas Alfstad; Dolf Gielen; Holger Rogner; Guenther Fischer; Harrij van Velthuizen; David Wiberg; Charles Young; R. Alexander Roehrl; Alexander Mueller; Pasquale Steduto; Indoomatee Ramma. *“Integrated analysis of climate change, land-use, energy and water strategies”*. Nature Climate Change 1789. June, 2013.

Philip J. Wallis; Michael B. Ward; Jamie Pittock; Karen Hussey; Howard Bamsey; Amandine Denis; Steven J. Kenway; Carey W. King; Shahbaz Mushtaq; Monique L. Retamal; Brian R. Spies. *“The water impacts of climate change mitigation measures”*. Climatic Change (2014) 125:209–220.

Estudos de caso

(Aula – 11/12)

Leituras para Análise:

ARROYO, Eveline M. V. *“Proposta metodológica para avaliação da vulnerabilidade da geração termelétrica a carvão mineral no Brasil às mudanças climáticas”*. Tese de Mestrado. PPE/COPPE/UFRJ, 2012.

HERERRA, Selena; PEREIRA JR, A.O.; LA ROVERE, E. L. *“Biofuels in a broader context of sustainability: the energy-land-water nexus and the Brazilian ethanol”*. In: 8th Conference on Sustainable Development of Energy, Water and Environment Systems – SDEWES Conference. Croácia, 2013.

Módulo 5: Apresentação Trabalhos Alunos

Sugestões de Trabalho Final:

- Análise Well-to-Wheel e variações
- Conteúdo Energético e de Emissões da Produção Econômica Brasileira
- ACV de plásticos pós-consumo: estado da arte no Brasil e no mundo (ou estudos de caso)
- ACV de biocombustíveis: estado da arte no Brasil e no mundo (ou estudos de caso)
- ACV no setor de cosméticos: estado da arte no Brasil e no mundo (ou estudos de caso)
- ACV de eletroeletrônicos: estado da arte no Brasil e no mundo (ou estudos de caso)
- ACV de embalagens: estado da arte no Brasil e no mundo (ou estudos de caso)
- Aplicação do NECAT para biocombustíveis
- Aplicação do NECAT para projetos energéticos
- Análise segurança energética, alimentar e de uso da água
- Estado da arte de PEIs (Parques Eco-industriais) no mundo: análise comparativa Europa, EUA e Países em desenvolvimento
- Análise de casos de PEIs e Simbioses Industriais (SIs) no mundo (de preferência de base renovável)