DigiNatal
Born Digital
eBook & eZine Publishing

A *'Distributed'* and Comparative Life-Cycle Inventory for 'Paradigm Progress' by Ravi Karumanchiri

With Modelled Delivery to Lebanon, Kansas, USA

SYNERLUX
Combined Insight

eBook Energy & Emissions

eBook Edition Delivered as a Digital Download Over the Internet — Scenario #1

To estimate the energy requirements and the emissions that result from the purchase and delivery of our eBooks over the Internet; we have relied on the research presented by Christopher L. Weber, Jonathan G. Koomey, and H. Scott Matthews; in their article entitled "The Energy and Climate Change Implications of Different Music Delivery Methods", published in the '**Journal of Industrial Ecology**' (2010, Yale University, Volume 14, Number 5). These researchers applied and/or established a number of statistics that informed our calculations, and we are very grateful to be able to draw on their work.

This means, on average, the online purchase and digital download of 'Paradigm Progress' entails 0.194 kg (0.427 lbs.) of carbon dioxide emissions.

eBook Edition	Electronic File Size	Transaction Data	Internet Power Usage	On-Site Power Usage	Computer Mfg Energy Req't	TOTAL POWER	Carbon Dioxide Emissions
.pdf	0.99 MB	2 MB	0.02093 kWhr	0.2 kWhr	0.08 kWhr	0.30093 kWhr	0.196 kg
.epub	0.389 MB	2 MB	0.01672 kWhr	0.2 kWhr	0.08 kWhr	0.29672 kWhr	0.193 kg
.mobi	0.449 MB	2 MB	0.01714 kWhr	0.2 kWhr	0.08 kWhr	0.29714 kWhr	0.193 kg
Average ►	0.609 MB		0.018 kWhr			0.298 kWhr	0.194 kg

Energy intensity of IP networks, Willow Winsna and Matthew Lode for assistance, the Million / Billion (M and B) Model, Jonathan Koomey, the process of online shopping, Amazon.com, Inc., Barnes & Noble, Inc., Apple Inc., Google Inc., Microsoft Corp., Yahoo! Inc. have assumed that the high-end version of Ø Ø Ø Transaction data includes a thread in which a customer visits 10 webpages before making a purchase, and that the file size of the eBook delivery of Paradigm Progress is being downloaded 1000 times. Our calculations are based on the average consumer's use of the Internet, regardless of how intentional.

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To the Internet infrastructure used by Willow Winsna and Matthew Lode for assistance, we have used a range of between 40W and 1 watt, to model the power requirements of the Internet. The 40W figure represents the average power used by the core, and the network energy overhead for the online shopping, purchase and digital download of Paradigm Progress. The 1 watt figure represents the power consumed by the access networks, and the 100 watt figure is our calculation.

The Kyoto Protocol emissions unit for Greenhouse Gas emissions is 1 MTCO2E (Million Metric Tonnes of Carbon Dioxide Equivalent). Our calculations are based on the following formula: Energy Consumed x Emission Factor = Greenhouse Gas Emissions. The emission factor we used is 0.65 kg of carbon dioxide per kWh, and we have assumed that the high-end version of Ø Ø Ø Transaction data includes a thread in which a customer visits 10 webpages before making a purchase, and that the file size of the eBook delivery of Paradigm Progress is being downloaded 1000 times. Our calculations are based on the average consumer's use of the Internet, regardless of how intentional.

Data Transmission Rates, Willow Winsna and Matthew Lode for assistance, the Million / Billion (M and B) Model, Jonathan Koomey, the process of online shopping, Amazon.com, Inc., Barnes & Noble, Inc., Apple Inc., Google Inc., Microsoft Corp., Yahoo! Inc.