GHG emission estimation for everyone, by everyone — carbon offsetting

28 January 2016

IPCC Open Symposium
“Science and policy to cope with climate change and the importance of GHG inventory to assess mitigation progress”

Japan Carbon Offset Forum (J-COF)
Energy-related CO\(_2\) emissions from residential

FY1990 131 Mt-CO\(_2\)

23 years \(\times 1.53\)

FY2013 210 Mt-CO\(_2\)

Source: JCCCA HP (http://www.jccca.org/)
Japan is the fourth largest emitter among the major emitters in the world.

Source: JCCCA HP (http://www.jccca.org/)
What Can We Do?

Energy-related CO₂ Emissions from Residential (FY2013)

2,300 kg CO₂ /person·year
6.3 kg CO₂ /person·day

- Electricity: 49.0%
- Gas: 7.3%
- Oil: 13.2%
- Gasoline: 22.9%
- Others: 7.6%

CARBON OFFSET FORUM
“Carbon offset” is an action to partially or entirely offset emissions generated from certain activities through constituent members of society (e.g. citizens, businesses, NPOs/NGOs, and local or national governments).
3 Steps for Carbon Offsetting

1. **Recognize**
   Calculate CO₂ emissions.

2. **Reduce**
   Make efforts to reduce CO₂.

3. **Offsetting**
   Offset unavoidable emissions by purchasing credits generated from GHG reductions/sink projects.
CO₂ emissions (t-CO₂) = Electricity consumption (kWh) × Emission Factor (t-CO₂/kWh)

Source: TEPCO HP

Source: Act on Promotion of Global Warming Countermeasures GHG Emissions Accounting, Reporting, and Disclosure System HP (Japanese only: http://ghg-santeikohyo.env.go.jp/)
**CO₂ emissions (t-CO₂) =**

**Fuel consumption (kt) × Emission Factor (tCO₂/kt)**

<table>
<thead>
<tr>
<th>对象となる排出活動</th>
<th>区分</th>
<th>単位</th>
<th>値</th>
</tr>
</thead>
<tbody>
<tr>
<td>燃料の使用</td>
<td>原料炭</td>
<td>tCO₂/t</td>
<td>2.61</td>
</tr>
<tr>
<td></td>
<td>一般炭</td>
<td>tCO₂/t</td>
<td>2.33</td>
</tr>
<tr>
<td></td>
<td>無煙炭</td>
<td>tCO₂/t</td>
<td>2.52</td>
</tr>
<tr>
<td></td>
<td>コークス</td>
<td>tCO₂/t</td>
<td>3.17</td>
</tr>
<tr>
<td></td>
<td>石油コークス</td>
<td>tCO₂/t</td>
<td>2.78</td>
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<tr>
<td></td>
<td>コールタール</td>
<td>tCO₂/t</td>
<td>2.86</td>
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<tr>
<td></td>
<td>石油アスファルト</td>
<td>tCO₂/t</td>
<td>3.12</td>
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<tr>
<td></td>
<td>コンデンセート(NGL)</td>
<td>tCO₂/kl</td>
<td>2.38</td>
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<tr>
<td></td>
<td>原油（コンデンセート(NGL)を除く。）</td>
<td>tCO₂/kl</td>
<td>2.62</td>
</tr>
<tr>
<td></td>
<td>ガソリン</td>
<td>tCO₂/kl</td>
<td>2.32</td>
</tr>
<tr>
<td></td>
<td>ナフサ</td>
<td>tCO₂/kl</td>
<td>2.24</td>
</tr>
<tr>
<td></td>
<td>ジェット燃料油</td>
<td>tCO₂/kl</td>
<td>2.46</td>
</tr>
<tr>
<td></td>
<td>灯油</td>
<td>tCO₂/kl</td>
<td>2.49</td>
</tr>
<tr>
<td></td>
<td>軽油</td>
<td>tCO₂/kl</td>
<td>2.58</td>
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<tr>
<td></td>
<td>A重油</td>
<td>tCO₂/kl</td>
<td>2.71</td>
</tr>
<tr>
<td></td>
<td>B・C重油</td>
<td>tCO₂/kl</td>
<td>3.00</td>
</tr>
</tbody>
</table>

Source: Act on Promotion of Global Warming Countermeasures GHG Emissions Accounting, Reporting, and Disclosure System HP (Japanese Only: http://ghg-santeikohyo.env.go.jp/)
Using Low-carbon Transportation
3 Offsetting

① Purchasing Credits

② Join a Project

Climate Change Mitigation Projects

CARBON OFFSET FORUM
Offset Credit... Offset credits are CO₂ (or other GHGs) emission reduction/sinking realized by others. Those credits are used for “compensation” in carbon offsetting activities.

Introduction of renewable energy

Forest management (Periodic thinning / Afforestation)

GHG Emission Reduction

Verification
Third Party

Forest Sink

Certification
Registration and Certification Committee
Projects Generate Offset Credits

GHG Emission Reduction Project
The projects can largely reduce CO₂ by exchanging the generation methods that used fossil fuels with renewable energy using solar power, wind power, waterpower, terrestrial heat, and natural methods, including biomass. In addition, there are various projects to reduce other GHG emissions.

Forest Management/Afforestation Project
Trees sink CO₂ as they grow. The projects can increase the quantity of CO₂ capacity of the forest through periodic thinning and afforestation.
## Credits Available for Carbon Offset

<table>
<thead>
<tr>
<th>Types of Credits</th>
<th>Start</th>
<th>Brief Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kyoto Mechanism Credits</td>
<td></td>
<td>These are globally-used carbon credits issued and operated under the UN authorities.</td>
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<tr>
<td>CER</td>
<td>2004</td>
<td></td>
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<td>J-VER</td>
<td>2008</td>
<td>It had certified emissions reduction/sinking deriving from domestic GHG emissions reduction/sinking projects.</td>
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<tr>
<td>Prefectural J-VER</td>
<td>2010</td>
<td>It had certified emissions reduction/sinking deriving from domestic GHG emissions reduction/sinking projects.</td>
</tr>
<tr>
<td>Domestic Credit Scheme</td>
<td>2008</td>
<td>Domestic GHG emissions reduction generated by small-and-medium size companies using technologies and funds provided by large enterprises.</td>
</tr>
<tr>
<td>J-Credit Scheme</td>
<td>2013</td>
<td>The J-Credit Scheme is the J-VER Scheme and Domestic Credit Scheme combined to seek further progress.</td>
</tr>
</tbody>
</table>
Carbon Market in Japan

Breakdown of Market Distributed Credits used for Carbon Offset in Japan
From 2007 to end of October 2015 (Based on the press releases)

- Prefectural: 25%
- J-VER: 2%
- Other: 6%
- CER: 67%

Breakdown of Market Distributed Credits used for Carbon Offset in Japan
From April 2011 to March 2013 (Based on the press releases)

- Prefectural: 77%
- J-VER: 3%
- Other: 7%
- CER: 13%

Average market price of credits purchased for carbon offset (2014)

<table>
<thead>
<tr>
<th>Credits Type</th>
<th>Price (yen/t-CO₂)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kyoto Mechanism Credits</td>
<td>565</td>
</tr>
<tr>
<td>Offset Credits (J-VER)</td>
<td>9,785</td>
</tr>
<tr>
<td>Domestic Credit</td>
<td>940</td>
</tr>
</tbody>
</table>
The following are the 5 major initiatives of carbon offset implemented in Japan. We can compensate for GHG emissions by purchasing carbon credits. We can also join the carbon offset initiatives through purchasing products and services or participating in the events.

**Offset Products and Services**
In this initiative, manufacturers or sellers of products or service providers compensate for greenhouse gas emissions emitted throughout the life cycle of a product or service.

**Offset for Meetings and Events**
In this initiative, organizers of concerts, sporting events, or conferences compensate for greenhouse gas emissions emitted in conjunction with that event.

**Offset for Personal Activities**
In this initiative, greenhouse gas emissions emitted in conjunction with personal activities, such as organizational business activities, are compensated.

**Products and Services with Credits**
In this initiative, manufacturers and event organizers attach credits to products, services, and tickets to assist in compensating for greenhouse gas emissions that occur in the daily lives of consumers or participants.

**Donation-type Offset**
In this initiative, manufacturers and event organizers invite consumers and participants in offsetting efforts that purchase/redeem credits for the purpose of contributing to and funding global warming prevention activities.
Carbon Offset Declaration

Yokohama Fule Sports Club Co., Ltd (Yokohama FC)

**Carbon Offset for Soccer Games (FY2014)**

- 1kg-CO$_2$ offset per supporter who participates in home games. (Offset is quadrupled if the team wins the game)
- Offset CO$_2$ emissions emitted from players’ transportation to away games.

**Amount of Credits:** 120t-CO$_2$

Credits:
- J-VER (Thinning project at Oguni Town in Kumamoto Prefecture)
- J-Credit (Solar power generation project)

**Carbon Offset with Dry Fruits**

- Utilizing figs that are difficult to keep fresh in shipping.
- Offset CO$_2$ emissions emitted by raw material procurement and the energy usage for production.

**Amount of Credits:** 2t-CO$_2$

Credits: J-VER (Thinning project at Nakatsugawa City Gifu Prefecture)

Atom Currency Executive Committee

**Carbon Offset of the Atom Currency (Local community currency)**

- Atom Currency is earned by joining in environmental activities of local community.
- Offset CO$_2$ emissions emitted from printing the Atom Currency.

**Amount of Credits:** 3t-CO$_2$

Credits: J-VER
- Thinning project at Tome City in Miyagi Prefecture

http://www.j-cof.go.jp/sengen/

*Regional Contribution*

*Support for Affected Areas*

*Citizen Participation*
You can do carbon offset by yourself to compensate for GHG emissions that occur in your daily life by purchasing credits at convenient stores or websites yourself.

**Lawson, Inc. CO₂ Offset Program**
http://www.lawson.co.jp/company/activity/co2/
You can purchase offset credits through ‘Loppi’, and exchange Ponta points for offset credits.
Credit: CER, J-VER

**ALL NIPPON AIRWAYS CO., LTD**
The ANA Carbon Offset Program
https://www.ana.co.jp/eng/aboutana/corporate/csr/offset/index.html
The CO₂ emissions from traveling by aircraft on domestic routes are offset through the ANA’s website.
Credit: J-VER  Forest Management Project

**Shikoku Carbon Offset Conference**
Shikoku Carbon Offset Market - Save the Earth
http://www.shikoku-carbonoffset.jp/index.html
You can purchase offset credits generated in the Shikoku area from 1kg-CO₂.
Credit: J-VER, Domestic Credit
Case Study at a School

Carbon Offset Activity of “Environmental Summit for High School Students” at Tokyo Metropolitan Tsubasa Sogo Senior High school

Learned the basics of Carbon Offset and how to calculate CO₂ emissions.

Calculated CO₂ emissions of event. Edited brochures to promote awareness of Carbon Offset.

Selected credits to offset. Researched the credits.

The Event Day
The Participants voted, and students chose the offset credits to compensate for CO₂ emissions emitted during the event “Environmental Summit for High School Students”.

CO₂ Emissions: 1t-CO₂
Energy Usage (Electricity, Gas), Water Usage, Waste, Mobility (Instrument, Tool), Transportation (Train, Bus)

Proposed Credits: 4 types
• Forest management project of Toki no Mori in Niigata Prefecture
• Forest management project of Ryujin no Mori in Niigata Prefecture
• Forest sink project in Iwate Prefecture
• Forest management project in Yamanashi Prefecture
Social Contribution through Carbon Offset

- Water Conservation
- Disaster Prevention
- Activate Forestry
- Employment Promotion
- Local Branding
- Development of Local Community
- Technological Innovation
- Realization of a Low Carbon Society
- Developing Countries Support
- Green Growth
Japan Carbon Offsetting Scheme

Carbon **Offsetting** Certification Label

Offsetting CO₂ emissions from a partial life cycle of products, services and events.

Carbon **Neutral** Certification Label

Offsetting total amount of CO₂ emissions.
Subsidy for Development and Sales Promotion of Environmental Contribution Type Products

MOE issues the subsidy for development and sales promotion of environmental contribution type products applies offset credits for manufacturers, suppliers, retailers and the specified area carbon offset councils.

**Purpose**

- Promote the return flow of funds from the urban area to the rural area
- Revitalize regional economies by promoting awareness of the region
- Conserve the local environment

**Contents (FY2015)**

**Target Projects**

1. Development of environmental contribution type products
   (Subsidy for development and sales promotion of environmental contribution type products)
2. Support by the specified area carbon offset councils
   (Subsidy for the specified area carbon offset councils to support the development of environmental contribution type products)

**Target Body**

1. Private group to develop the products
2. Private group to support as the specified area carbon offset councils

**Amount of Subsidy**

1. 500,000yen per product
2. 100,000yen per product to support (Up to 10,000,000yen per council)
Textbook of Carbon Offset

TEXT
0. Introduction
Learning about the Climate Change issue and the relationship between our lives and Global Warming.

1. Text of Carbon Offset
Learning the basics of Carbon Offset.

WORK SHEET
2. WORK SHEET of Carbon Offset
Better understanding by calculating CO₂ emissions from school life and choosing the appropriate credits to offset.

RESEARCH
3. RESEARCH in Carbon Offset
Establishing knowledge of Carbon Offset and the Climate Change issue through research.

Game
4. Carbon Offset Game
Establishing the abilities to solve the problem through the game.

Carbon Offset Text Website  http://www.j-cof.go.jp/friends/text/
Download the textbook and tools are available.
Carbon Offset Forum Website

http://www.j-cof.go.jp/

Social Contribution through Carbon Offset
(For citizens who would join carbon offset)

http://www.j-cof.go.jp/sengen/

http://www.j-cof.go.jp/friends/
The Latest Information about Carbon Offset

You can download documents and brochures from the J-COF Website.

The latest information about carbon offset and credits is...

**Carbon Offset Forum (J-COF)**
http://www.j-cof.go.jp/e/

**Useful Sites about Carbon Offset, Carbon Credits**

- **Ministry of the Environment (MOE)**
- **Japan Carbon Offsetting Scheme**
  http://www.jcs.go.jp/e/
- **Offset Credit (J-VER) Scheme**
  http://www.j-ver.go.jp/e/index.html
- **J-Credit Scheme**
- **KYOTO Mechanisms Information Platform**
  http://www.kyomecha.org/e/index.html
- **New Mechanisms Information Platform**
  http://www.mmechanisms.org/e/