



Local LCS “TIPS”

from Shiga SD2030 Scenario Study

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(ESS)
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Shiga SD 2030

Base year : 2000

Target year : 2030

Env.target : -50% of 1990 CO2 emission
(Water quality, Waste disposal)



Calculation system : Menoco (ESS)

Demonstration

Microsoft Excel - SS_Shiga_Energy_070214

結果(90年比排出量) 56.1%

部門別二酸化炭素排出量 kt

LS 二酸化炭素削減内訳 1990=

■エネルギー消費量

2000	2030	石油	ガス	バイオ	太陽
167	199	79	94	0	9
64	89	1	112		
34	62	2	197		
34	52	21	83		

削減効果

LS	A	B	LS
521	90%	81%	90%
12	56%	40%	80%
130	92%	86%	95%
158	95%	90%	86%
34	95%	90%	90%
214	95%	90%	90%
548			

2030 Aケース

石油	ガス	バイオ	太陽	熱	水素
29%	30%	1%	15%		
27%	38%				
14%	44%				

2030 Aケース

石油	ガス	バイオ	太陽	熱	水素
1.12	1.12	1.00			
1.12	1.12	1.12	1.00		
1.38	1.38	1.38	1.38		

2030 Aケース

石油	ガス	バイオ	太陽	熱	水素
0	0	0	0	0	0
23.26	24.66	1.055	0	0	0

表対BaU/対策表対2000/拡張表対BaU/拡張表対2000

設定/全GHG/総括/家庭/対策表対BaU/対策表対2000/拡張表対BaU/拡張表対2000/業務/産業/

Microsoft Excel - SS_Shiga_Energy_070214

LSのシナリオ設定

※青字がここで操作する係数

家庭

項目	設定値	単位	備考
人口	1381.8	千人	滋賀県推計 = 1153千人
平均世帯人員	2.65	人/世帯	BaUは2.65人/世帯
効率改善率全般	3		ドロップダウンリストから選択 1: 2000年効率で固定 2: Aシナリオ(中位)の効率 3: Bシナリオ(高位)の効率
住宅断熱水準	45%		ドロップダウンリストから選択 1: 2000年効率で固定 2: Aシナリオ(中位)の水準: 暖房需要を35%削減 3: Bシナリオ(高位)の水準: 暖房効率を45%向上
製品導入率			
非電化冷房	10%	普及率	冷房の燃料を太陽として計算する
パッシブソーラー暖房	10%		完全にはまかなえないので、普及率の半分の需要を削減と仮定する。
薪ストーブ	10%		パッシブソーラーの後に暖房需要をバイオマスに振り替え。
太陽温水器	20%		給湯サービス需要を太陽に振り替え。
バイオマス風呂	10%		薪で薪室・便利にお風呂を湧かす技術が出来たと仮定。
バイオガスコンロ	10%		燃料シェアをバイオマスに
自然採光照明	2%		その他家電の20%のうち普及率を太陽に
保温調理器・圧力鍋	40%		暖房需要の5%半分以上を削減とし、普及率のサービス需要を4分の1にする。
非電化冷蔵庫	2%		その他家電の需要の22%が冷蔵庫。その他からシェアを太陽へ。
心がけによる需要削減			「コマちゃん」的な取り組みの効果。もともとサービス需要を削減。
冷房	10%	削減率	
暖房	20%		
給湯	5%		
厨房	10%		
家電	10%		
HEMS	3		Home energy management system
冷房	9%	削減率	家庭のエネルギー需要量を一律削減する。
暖房	9%		1: 導入なし
給湯	9%		2: Aシナリオ 5%削減
厨房	9%		3: Bシナリオ 10%削減
家電	9%		

Calculation system : conclusion

- Arrange ESS for your situation
 - > advantage of EXCEL tool
 - > add new seat,
- EST is a useful tool for a meeting
(rather than calculation result itself)

Data collection and compensation

- How to collect base year data?
 - > Usually, energy data in local scale is scarce both in supply and demand.

- We must estimate it from available data.
 - > Two technique: bottom up & top down (decomposition)



Bottom-up approach

- When you can know individual volume -
 - Found data in ONE UNIT of activity.
(ex. energy purchase in one family)
 - > in Japan, we can use household expenditure data by prefecture.
(Shiga,too. You can also use national data.)
- Multiply the data by the total number of activity unit.
(ex. number of family)



Example:

Kerosene consumption per family

* Number of family in the region

= total kerosene consumption in the region

Problem with Bottom-up approach

- Diversification among the families.
 - > Regional difference
 - > Income class
 - > Number of occupants
- Tips
 - > Compensation by CLIMATIC division
 - > use data by Income class, by Number of occupants, etc.



Top-down approach

- When you can know total volume-
 - Find larger area data, or national total
(ex. Gasoline sells in Kinki region)
 - Divide it by the ratio of appropriate Index
- > You should select best available Index related.
(ex. number of cars possessed)



Example:

National Gasoline sells

*Vehicle number of the region

/ Vehicle number of the country

= Gasoline consumption by Vehicles in
the region

Problem with Top-down approach

- Again, regional variation.
 - > find compensation index
 - Difference with estimated volume by bottom-up approach (Shiga's example)
 - <bottom up approach of Gasoline consumption>
 - Transport volume of vehicle (Passenger-km)
 - * Average passenger number of one vehicle (P/vehicle)
 - * Fuel efficiency (liter/km/vehicle)
 - = Gasoline consumption
 - > top-down approach Gasoline consumption
- >We compensated the transportation model by the difference

+1: Problem of the year of survey

Base year : 2000

Survey year : 1998 & 2003

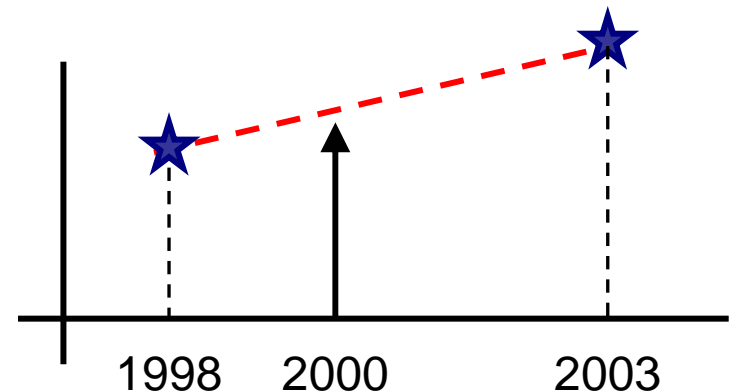
1998	2000	2003
425	?	520

-> Linear interpolation

$$(520 - 425) \div 5 \times 2 + 425 = 463$$

Year of the most important
survey should be base year
of LCS scenario.

(ex. National census, IO table)



Assume linear transition



Data availability problem: conclusion

- Make an effort to estimate indirectly.
(bottom-up, top-down)
- Write memo about how you estimated it, as frequent & as detailed as possible.
(especially, what you **implicitly assumed**)
- Compensate by other way of estimation, if necessary.
- It may be better to conduct own survey for LCS scenario, if you can. (ex. household consumption)

For a "usable" Local LCS study (1)

- Co-operation with local officer
 - Have frequent meetings
 - Make co-operation atmosphere each other
 - Put LCS vision on the agenda of the region
- > To make meaningful your research in the real world.
- > You may be able to be given data, which are difficult to get usually.

For a "usable" Local LCS study (2)

■ Role of researchers: Education

- General knowledge of climate change problem and its importance
- What they can do as local action
- How closely making LCS is related to local policy

-> Conduct a meeting with various VIP of the region to discuss future LCS vision

(local officers, economic leaders, NGO members, etc)

-> Again, ESS it useful in the meeting

(you can operate ESS in front of them)

(make any changes by the request of participants)



Thank you

