Future World

S P T E SP

Super Global High School

平成29年度

SP卒業論文選

清風南海学園 中学校・高等学校

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巻頭言

清風南海高等学校
SGH プロジェクトチーム

SGH（スーパーグローバルハイスクール）指定を受けて、早くも 3 年がたちました。本校の生徒に相応しい SGH として SP（シナリオ・プラニング）の取り組みを発想し、以来様々な試行錯誤を行ってまいりました。この度、「卒業論文集」という形によって、グローバルコース 1 期生 2 クラス 78 名の 3 年間の成果を世に問うことができ、喜ばしい限りです。これは、ひとえに関係者の皆さまの様々なご指導・ご鞭撻の賜であり、ここに厚く御礼を申し上げる次第です。

これまでにない取り組みであったがゆえ、「考えながら走る」方法で進めて行くしかなく、「未来の生徒の成長に資する取り組みであること」に価値を置きつつ、遅々たる歩みであるものの、生徒達の成長とともに教員やシステムも進化していったのではないかと思われます。また、初年度であるが故に自由気ままにやることができたという面もあり、この間調査や議論に費やした時間は、生徒の様々な能力の伸長に間違いなく寄与することとなり、最終的には勉学の面にも好影響を与えることができたと感じられます。

本冊子は、まず第Ⅰ章で SP（シナリオ・プラニング）に取り組むこととなった経緯・考え方と、その手法を簡単にまとめました。第Ⅱ章では班毎に論文の概略を見開き 2 ページにまとめましたが、3 年生において英語による要約（アブストラクト）を作るという課題の成果を見ることができます。第Ⅲ章は、8 班に分かれて 2 年生より 2 年間に渡り取り組んできた SP の論文のうち、2 年時に本校で開催の国際シンポジウム（平成 28 年 10 月 29 日）でプレゼン発表を行った 2 班の論文であります。その前半は班員の討論によってまとめられた「共通部分」であり、後半はそれを受けて各個人が取り組んだシナリオや独自に研究した「個別論述部分」の一部であります。最後の第Ⅳ章は、本校 SGH とその主軸たる SP の構想を主導し、SP を生徒とともに実践したプロジェクトチームの一員である戸原克明による一文「高校生向け学習教材としてのシナリオ・プランニング～清風南海高校の SGH 構想～」です。本校のプロジェクト立て上げ時の苦労や SP の手法を詳しく説明しておりますので、是非ご一読ください。

班や個人によって取り組み方に違いはありますが、真剣に意見を戦わせるという貴重な体験の結晶がこれら作品となりました。「もっとやりたかった」との思いが各生徒に少なからずあると思われますが、これらの作品は、今後の人生の様々な場面における「基礎」として十分なものを、すべてのグローバル生が身につけることとができた証でもあります。

冊子を読み返すにつれ、生徒・教員ともに様々な議論や発表の場面を思い浮かべることが出来るでしょう。各生徒がこの 3 年間の経験で身につけた事柄に自信を持って、今後の人生のすべての場面において、しっかり取り組んでくれるものと期待します。また、この冊子が後輩諸君や他校の皆さまのご参考となれば幸いでもあります。

今後とも、本校の SGH 活動に対するご理解とご支援をお願い申し上げる次第です。

第Ⅰ章

SGH 事業と SP

－目次－

この章は、本校が SGH に応募して採用されて以来、グローバルコース一期生が 3 年間をかけて実施した SP(シナリオ・プランラング)の活動をまとめ、記述したものである。拙文により、SGH に対する本校の考え方や SP という発想に至る経緯、具体的な SP の方法や実施担当者の思いが少しでも伝われば幸いである。

なお、この章の紙面構成は 2 ページ見開きとし、左は「考え方や作業の大きな流れ」、右にはその「補足的な説明や資料」を配置した。できるだけわかりやすく簡潔に記述したつもりである。なお、底本としては、以下に挙げるものを用いた。

本校 SGH 校構想調書およびその概要
SGH 研究開発実施報告書や国際シンポジウム・中間発表会の資料冊子
文部科学省ホームページ等
SP 卒業論文集（全体版）書載の「高校生向け学習教材としてのシナリオ・プランニング ～清風南海高校の SGH 構想～ 」戸原克明
生徒の参考のため、「USJ の 10 年彼のアトラクションがどうなるか」をトピックとして実施した SP

１．本校の SGH 構想

SP とは何なのか？

〈簡単に言うと〉
・「〇〇年後の△△」という形で定めたテーマに関する未来を描く手法の 1 つ。
・「テーマに大きな影響を与えるが、今後どうなるか不確定な」因子 2 つを探す。
・2 つの因子それぞれが＋－のいずれに動くかで、4 つの未来のシナリオを描く。
・このようにして「起こりうる複数の未来」を論理的に作り上げ、未来の多様なリスクに備えようとするもの。

では、なぜ SP なのか？　そして、そもそも、本校はなぜ SGH に応募したのか？

50 年を超える歴史を持つ本校は、高い進学実績と人材輩出など私学の進学校としてそれなりの地位を築いて来た。	グローバル化という時代の変化に伴う、大学入試などを含む教育改革のうねりの中、本校としても必然的に制度的な改革を進める必要があった。

本校でも当然「グローバルな人材育成」を目指していたことから、SGH に手を挙げて改革をさらに進めることとし、本校に相応しい SGH の形を模索。

〈議論の流れは以下の通り〉
①文部科学省の構想、すなわち「グローバル・リーダー育成」のためには、まず第一に本校の考える「グローバルリーダー像」の構築が必要。
②それを「地球規模の視野を持って世界のあり得べき未来図を描き、社会をより良い方向に導いていく人材」と定義し、その育成のために、「未来を読み解く力」と、「世界に発信する力」を身につけるための教育システムを開発する。
③本校生徒・教員の特性、強みと弱み、学校の教育方針やスクール・アイデンティティに鑑み、SGH 構想で取り上げられた様々な能力の内、「論理的思考力の育成」を本校 SGH の中心課題と位置づける。
④その手法を探る過程で、シナリオ・プランニング（SP）と出会う。

<SGH、国の構想>

平成 26 年 1 月 14 日 文部科学大臣決定　（一部省略）

１．趣旨

高等学校等におけるグローバル・リーダー育成に資する教育を通して，生徒の社会課題に対する関心と深い教養，コミュニケーション能力，問題解決力等の国際的素養を身に付け，もって，将来，国際的に活躍できるグローバル・リーダーの育成を図ることとする。

２．事業目的

グローバル・リーダー育成に資する教育課程等に関する研究開発を行う高等学校等をスーパーグローバルハイスクールに指定する。あわせて，高大接続の在り方についても研究開発を行う。

〈文科省ホームページ〉

◆目的　：急速にグローバル化が加速する現状を踏まえ、社会課題に対する関心と深い教養、コミュニケーション能力、問題解決力等の国際的素養を身に付け、将来、国際的に活躍できるグローバル・リーダーを高等学校段階から育成する。

◆事業概要　：国際化を進める国内の大学ほか、企業機関等と連携して、グローバルな社会課題発見・解決し、様々な国際舞台で活躍きる人材の育成に取り組む高等学校を「スーパグロバルハイスクーク」に指定し、質の高いカリキュラムを開発・実践する。

<本校生徒の持つ課題>
（と捉えられたもの）

課題①　保守的なキャリア志向
課題②　危機感（論理的思考力）の不足
　ー論理的な思考力の不足から来る楽観的な考え方ー
課題③　英語学習における「話す」能力の未成熟
課題④　主体性の不足
課題⑤　情報処理能力の未発達

〈本校 SGH の内容・目標の基本的要件〉

◇一定以上の学力・知識レベルである本校の生徒に見合った「進学校型 SGH」
◇難度の高い活動を構築する。
◇推薦入試にも対応できるが、いわゆる受験学力を低下させない。
◇英語に偏重せず、コミュケーション手段として活用する中で、「話す」力も含めた英語力を自然と身につけさせる。
◇世界でリーダーとして活躍する人材の育成。
そのためには「将来へのヴィジョン」を持たねばならない。
◇特定分野だけに偏らないジェネラリスト育成。
◇生徒の今後のキャリア構築に資するもの。

２．SP を行うために

〈SP とは？〉
大手エネルギー会社ロイヤル・ダッチ・シェル社が用い、世界の多くの企業がその予測を参考にしていることで有名な未来予測の手法。

〈SGH 構想の議論と SP〉
◇生徒の「課題発見能力を育成」する際、テーマ設定の段階から教員が一緒に考えながらにじっくり作り上げれば、非常によいものが出来るだろう。
◇担当教員の数、「受験のための教科学習」に差し障らない程度の SGH 授業時間数の確保等、指導する側の物理的な制約を考え、「テーマ設定を限定的なもの」に。
◇「○○年後の△△を考える」という、トピックの型が限定された SP（シナリオ・プランニング）という手法に行き着いた。

高校生にとって無理のなく SP を習得出来る「カリキュラム」を作る。

<SP を支えるもの（右図）の必要性〉
通常、SP は所属する会社や組織の経営戦略を考える際に取り組むことが多く、基本的な知識や経営の方針などは十分承知している集団が取り組むことになる。
高校生に対しては、カリキュラムを整備して知識や考え方を指導する必要がある。

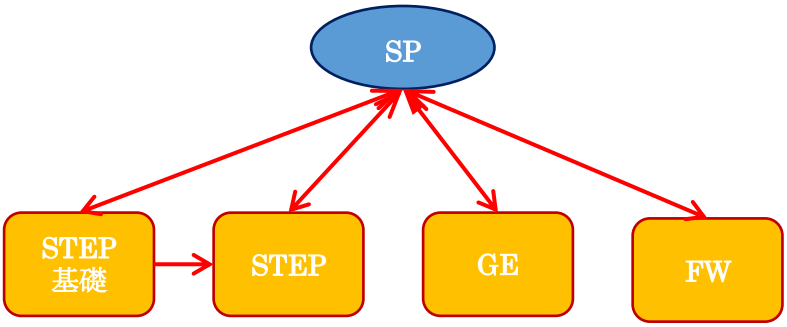
【STEP ゼミ】	【GE】	【国内・海外 FW】
PEST 分析の手法を用いて、 Political(政治学的分野), Economic(経済学的分野), Societal(社会学的分野), Technological(科学技術的分野) 4 側面から分析する手法を学ぶ。	(ｸﾞﾛｰﾊﾞﾙ・ｲﾝｸﾞﾘｯｼｭ) 主に「話す」能力を育成。下記発表会では、英語でのプレゼンを実施。	(ﾌｨｰﾙﾄﾞﾜｰｸ) 他国の大学生・高校生との交流（発表・討論・SP） 自国文化の相対化 関東 2 方面、ﾌｨﾘﾋﾟﾝ、ﾏﾚｰｼｱ･ｼﾝｶﾞﾎﾟｰﾙ、ﾍﾞﾄﾅﾑ

【中間発表会・国際シンポジウム】	【タブレット端末の導入】
年 2 回の代表による舞台での発表と全員によるポスター発表の機会を設ける。 発表する・質問に答える・評価される等による刺激、次の学年の生徒への継承。	本校生徒の弱点の 1 つと言われていた ICT 技術の未熟は、全生徒がハードを手にすることによって、活用面も飛躍的に充実した。

SP を生徒に指導しながら実施する授業の流れを、12 ページから示す。

◇実地に指導する中、高校生にやりやすい形態を考え、独自の工夫を行いながら試行錯誤を重ねた。従って、一般に行われている SP とは相違点も多いと思われる。

◇カリキュラムの構造



〈Pest 分析（本校では STEP ｾﾞﾐ）〉
企業が、自社を取り巻くマクロ環境（外部環境、世の中の流れ）の変化が現在や将来にどのような影響を与えるか、把握・予測するためのフレームワーク（枠組み） P=Politics（政治）, E= Economy（経済）, S=Society（社会）, T=Technology（技術）の 4 つの視点から分析し、事業戦略立案やマーケティングの機会と課題の発見に活用
〈4 つの視点に関連するキーワード〉
P：法律や条例、法改正、判例、規制緩和・条約・税制・政治、政権体制などの動向、公的補助、判例・規制緩和 E：経済成長や景気の動向、物価や為替動向、賃金動向、株価、金利・物価、消費動向・経済成長率 S：ライフスタイルや生活者としての意識の変化、人口、人口構成、密度・社会インフラ・流行、世論、事件・高齢化、少子化、言語、教育、宗教 T：商品開発技術や生産技術、マーケティング技術の変化、インフラ、ビッグデータ・IT、新技術、開発、特許、イノベーション（技術革新・新たなサービスや価値観）

◇各授業・行事の詳細については、報告書や国際シンポジウム、各中間発表会等の冊子を参照のこと。

◇一般に、SGH は文系的な内容に偏りがちであるが、ジェネラリスト養成が本校の SGH の目標であり、生徒も文理分けがされていない時期にグローバルコースを選択する。従って、文理混合のクラスでの活動という特色を持つことになった。

3. How to do SP

ステップ⓪

《テーマの設定》

大きなテーマの設定。これについては、教員が指定する形をとった2年生の段階で、3回のSPを実施した。第3回は本来の本校SGHの目標である「エネルギー」をテーマとして、本格的なものを目指した。

ステップ①

《トピックの設定》

上記のテーマと区別するため、具体的な「○○の△△年後はどうなるか」という形のものを「トピック」ということにした。生徒の各班がテーマにしたがって、トピックを決める作業である。

ステップ②

《ドライビング・フォースの列挙》

①で定めたトピックに影響を与える因子(ドライビング・フォースDF)を思いつく限り取り上げて列挙する、協働作業。

ステップ③

《IUマトリクスに適用》

「トピックに大きな影響を与えるが、今後どうなるか不確定な」DFを見つけるため、②のDFを、X軸に影響力(Impact)、Y軸に不確実性(Uncertainty)をとった座標平面に配置しながら、議論。

→◎

ステップ④

《SP2軸の決定》

③のIUマトリクスの第1象限で原点から遠いDFを選び、SPで用いる2軸を決定することになる。ただし、互いに影響し合う・因果関係があるDFは避けたい。

→□

ステップ⑤

《SPマトリックス各象限のDF動向チェック》

4つの象限毎にシナリオを作成する。2軸にとらなかったDFやその他の因子（→※）についても、その影響・関わりについて考察しておくことが、ダイナミックなシナリオを作るために有益である。

ステップ⑥

《シナリオ作成》

各象限のシナリオには、その内容を象徴するような「シナリオ・タイトル」をつけることで、直観的イメージを持つことができる。また、シナリオを示したり、意識の共有や作成の効率が図れる。

→◆

ステップ⑦

《論文の作成と英語による要約（Abstract)》

各班のSPの過程や完成した4つの象限のシナリオを「卒業論文」としてとりまとめる。その構成は、右の通り。

まず、生徒を 10 人程度の班に分ける。ただし、構成員が STEP ゼミの 4 つの分野（Societal，Technological，Economic，Political）が出来るだけ均等になるようにしたい。本校では、7 つのステップに分けた手順を元にワークブック「SP ノート」（下図）を作成し、それに記入させることで流れを確認しながら作業を進めた。

第 1 回のテーマは生徒が興味を持ちそうな話題として「教育の ICT 化」「ゲーム産業」「USJ（ユニバーサルスタジオジャパン）」からの選択とし、第 2 回は手順の理解と定着のため、変則的ではあるが個人による SP を「大学」をテーマとして行った。

→◎これを、IU マトリクスと称することにする。
　生徒の経験のなさ、知識の浅さが露呈する部分である。ここでしっかり議論することが大切で、「理由」「根拠」となる資料を探し、エビデンスを得ることを心がける。

→◆「よいシナリオ」が出来るまで、トピックの設定に戻って繰り返し議論を重ねる。

→□2 軸は、可能な限り具体的な内容のもので、数値（「○○の□□%が△△となる」等）で表すことが望ましい。一方、全く独立した DF を 2 つ取って来ることは難しい。

→※その他の因子：「トレンド」や「ブラック・スワン」
「トレンド」と呼ばれ、確実に起り影響力も大きい DF についても、確認しておく必要がある。また、戦争や大災害など「ブラック・スワン」と呼ばれるものは、多くのことに破滅的な影響を与えてしまうので、ここでは DF として取り上げない。

〈第Ⅱ章「各班の内容（概略）」には、以下の項目で論文のまとめを掲載〉

トピック
DF（ドライビング・フォース）
SP マトリックス模式図
①トピックの選定理由　〈英文〉
②トレンドの動向　〈英文〉
③X 軸選定理由　〈英文〉
④Y 軸選定理由〈英文〉
４つの象限のシナリオ〈英文〉

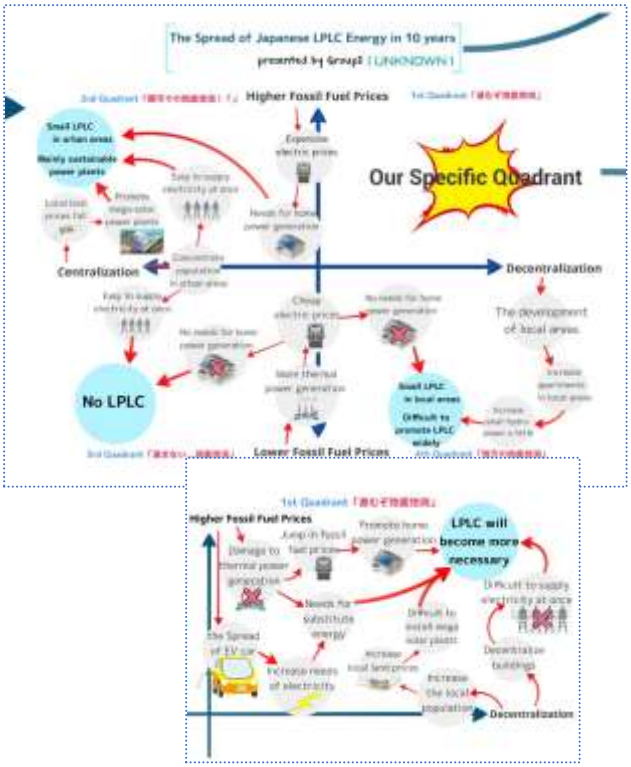
４．SP の具体例

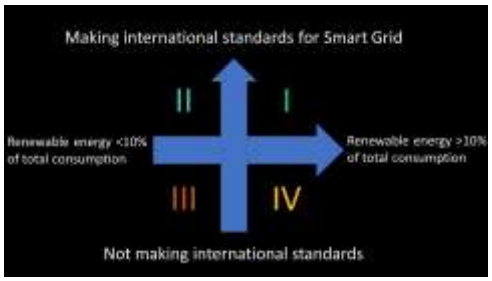
ここでは、SP の流れを再確認しつつ、見本として教員が提示した具体例によって説明を試みる。また、指導するに当たっての注意点などをまとめておく。

ステップ⓪	《テーマの設定》 USJ（ユニバーサルスタジオジャパン）	
ステップ①	《トピックの設定》 USJ の 10 年後のアトラクションがどうなるか	
ステップ②	《ドライビング・フォースの列挙》 A, B, C, D, E, F, G, ……	→○
ステップ③	《IU マトリクスに適用》	→◇
ステップ④	《SP２軸の決定》 「大阪にカジノができるかどうか」 「中国経済が維持されるかバブルが崩壊するか」	→◆

〈→16 ページに続く〉

図は、2016 年 10 月 29 日の国際シンポジウムにおいて、生徒が行った SP に関するプレゼンのスライドの一部である。



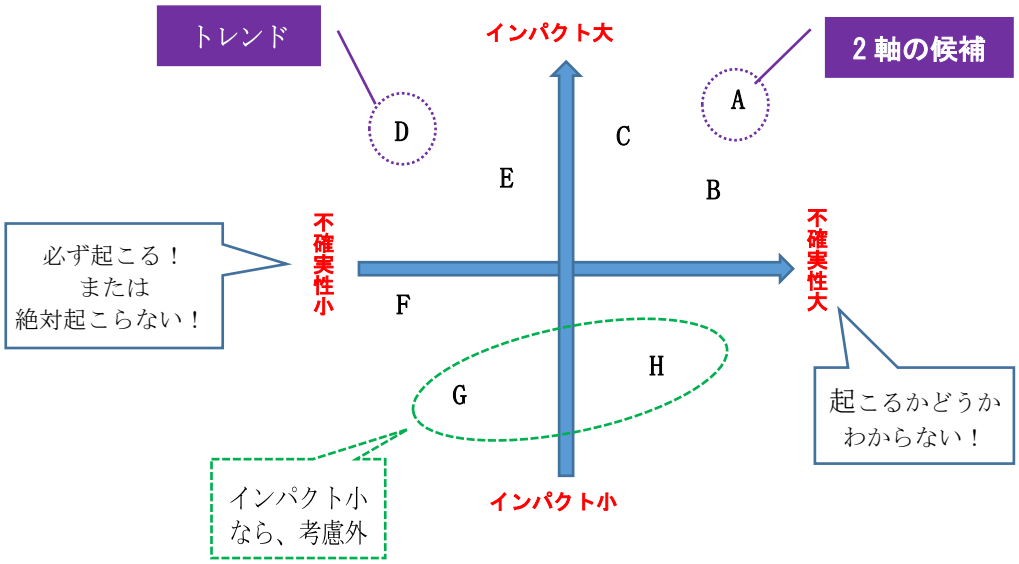


素直で与えられた課題をしっかりこなす生徒達であるが故に、冒険をしない傾向がある。その結果、ありふれた議論に終始し、「無難な結論」へ帰着させようとすることも多い。また、どうしても模範解答を求めようとするのだが、SP が「同程度の確率で起こりうる複数のシナリオを考え、未来に備えようとする手法」であることの理解が重要である。

→○ブレインストーミングを用いて、各人が思いつくままのアイデアを出し合う。
付箋に書き、模造紙に貼り付け（拡散）
⇒俯瞰して、カテゴリーによるグループ分け（収束）

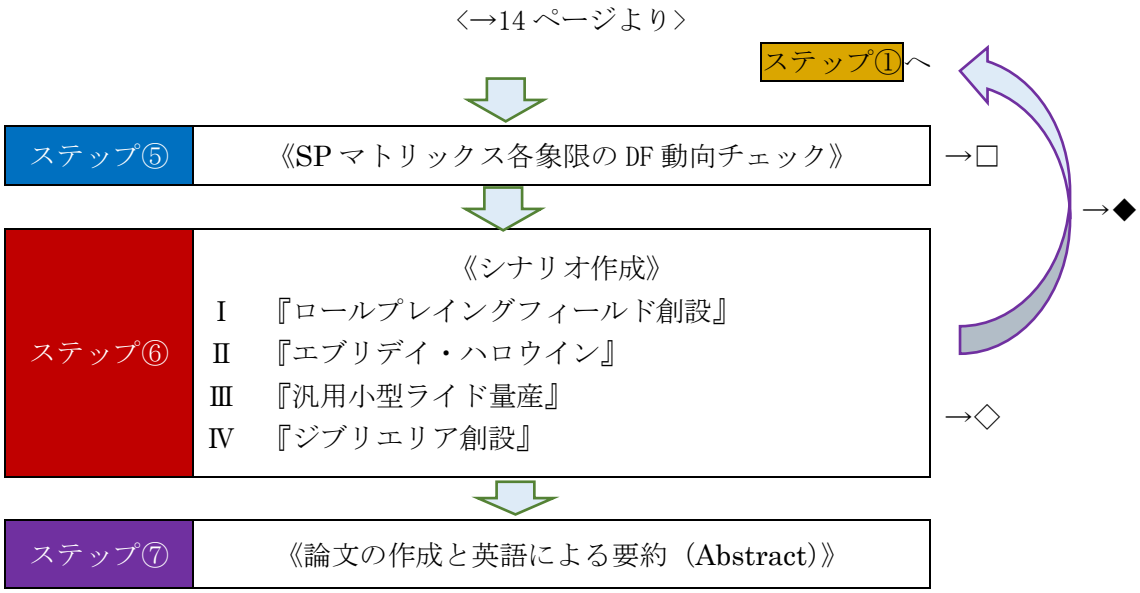
→◇ここからが難しくなる。「不確実性の意味」の理解、バイアスを排除した冷静な判断とエビデンスをきちんと求める態度をとることの重要性の理解が求められる。また、議論を十分尽くすよう、教員側による指導も必要となる。

IU マトリクス



→◆IU マトリックスにおいて第Ⅰ象限で原点から最も遠い 2 つ、つまり、不確実性が高くインパクトの大きい DF が 2 軸の候補となる。具体性があり、できるだけ干渉し合わない 2 軸をとってくる。また、各象限のシナリオをイメージすることで、「面白い」ものとなりそうな DF を選びたい。実は、これが高校生にとってなかなか難しい。

SP の具体例（承前）



以下、教員が例示したシナリオの一部である。(右の SP マトリクス、参照、)

［第 1 象限］:『ロールプレイングフィールド創設』
国内の景気が小康状態を保つ中、カジノを中心に大阪は経済活動が活発化する。MR（Mixed Reality=Virtual Reality +Augumented Reality 仮想現実+拡張現実）の技術発展が進む中、カジノに来た外国人観光客（主に中国人）に受けるように、クールジャパン的なコンテンツが拡大。……動き回るための空間の広さがある程度必要になるが、それは増収分から負担して、夢洲付近の土地を入手して充てる。……
［第 2 象限］:『エブリデイ・ハロウイン』
中国経済を中心に先行きに不透明さが残る中、地域活性化の手立てがなく、日本中で閉塞状態が続く。……USJ では音楽等の演出を凝らしてパレードやコンサートを行い、ひとときの享楽の場を提供することで、……
［第 3 象限］:『汎用小型ライド量産』
世界的に経済活動が縮小する中、日本では東京の一極集中化が進み、大阪はより一層の不況に見舞われる。……設備投資にお金をかけることはできないため、汎用性の効くライドを作成した上で、MR のコンテンツでマイナーチェンジを繰り返すようになる。……

なお。トレンドの動向(＋テーマパークの対応)として取り上げたものは以下である。

①少子化の進行　→　大人も取り込む形態
②映画産業の動向　→　邦画を含む多様なコンテンツ
③ＶＲとＡＲ（上記）の普及　→　アトラクション形態の変化

→□2 軸にとらなかった DF を SP マトリックスの各象限に当てはめたとき、その動向を表などにしてまとめておくとよい。

DF＼象限	Ⅰ	Ⅱ	Ⅲ	Ⅳ
C	↑	↑	↓	↓
D	↑	↓	↑	↓

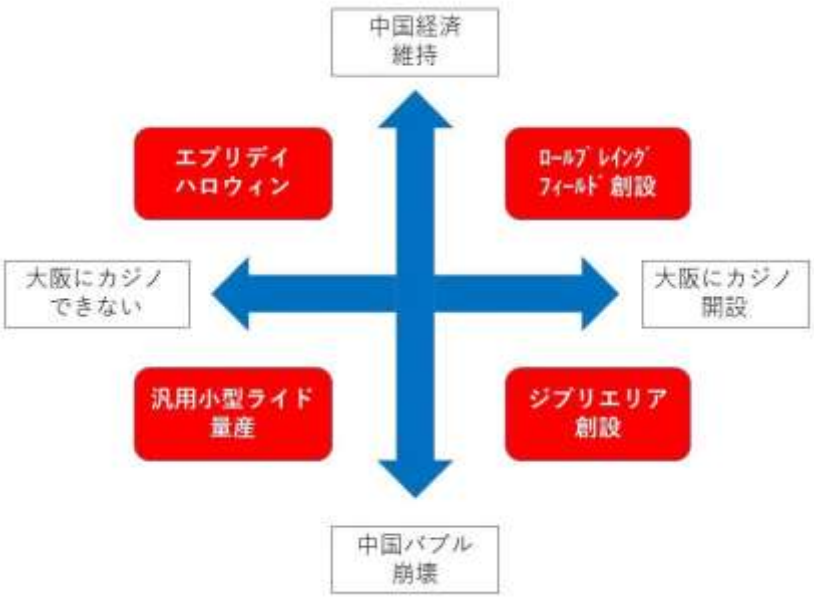
……

→◇今回の USJ に関する SP の具体例では、４つの象限にそれぞれ左のような「シナリオ・タイトル」が付けられた。指導をしていく中、「よいシナリオ」「面白いシナリオ」とはどのようなものか、が明らかとなってきた。

良い SP とは「想像力を論理的に発展させ、未来を良い方向へ導く術を模索する」もの
①具体性が高く、4 つのシナリオの差異が明確なもの
　4 つの象限は、それぞれ等しく可能性のある未来を描いているか。
②因果関係の連鎖が論理的につなげられたもの
　変化は連続的なものであり、物語として線（因果関係）でつながっている。
③背景に膨大なエビデンス(根拠)があることを感じさせるもの
　論理性と正当性を常に追究する態度を崩さない。
④未来を良い方向へ向かわせようという意気込みが感じられるもの
　当事者としての意識を持って議論し、考察する態度

→◆「よい・面白い」シナリオを作り上げるには、2 軸を選び直して SP を行う、試行錯誤が大切である。

SP マトリクス



付　SP をめぐる 3 年間の流れ・ポスター集

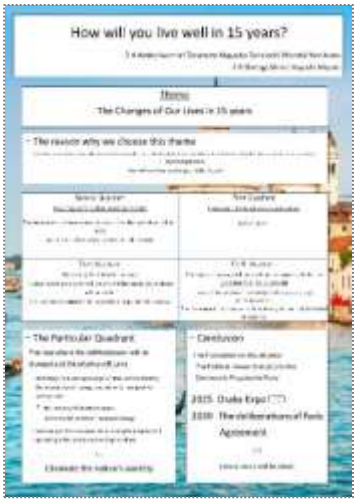
《1 年生》

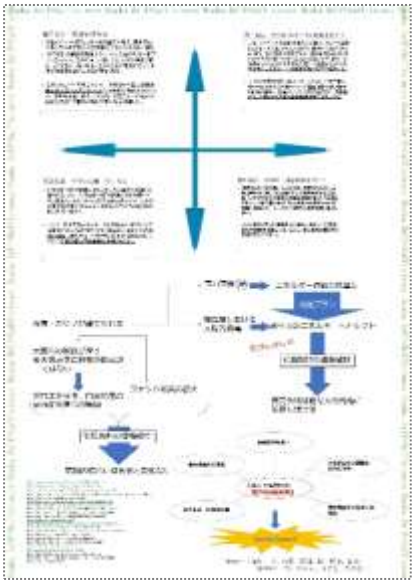
	月	STEP		その他
第一年次	4	STEP 基礎	GE	講演会 特別授業 FW
	5			
	6			
	7,8	FW・中間発表準備		
	9	**第 1 回中間発表会**		
	10	STEP 基礎	GE	講演会 特別授業 FW
	11			
	12			
	1	中間発表準備		
	2	**第 2 回中間発表会**		
	3	**国内・海外 FW**		

ここに掲載したポスターは、2016 年 10 月 29 日の国際シンポジウムにおけるポスター発表で使用したものである。（当日プレゼン発表を行った 2 班を除く、6 班分である。なお、残り 2 班の論文は、第Ⅲ章参照）

《2 年生》

	月	STEP		その他
第二年次	4	STEP ｾﾞﾐ SP	GE	講演会 特別授業 FW
	5			
	6			
	7,8			
	9	国際ｼﾝﾎﾟｼﾞｳﾑ準備		
	10	**国際シンポジウム**		
	11	STEP ｾﾞﾐ SP	GE	講演会 特別授業
	12			
	1	中間発表準備		
	2	**中間発表会**		
	3	**国内・海外 FW**		

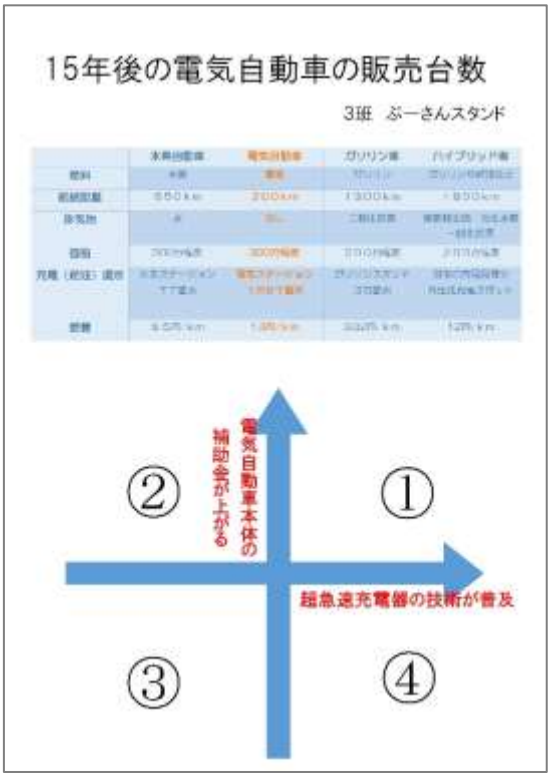


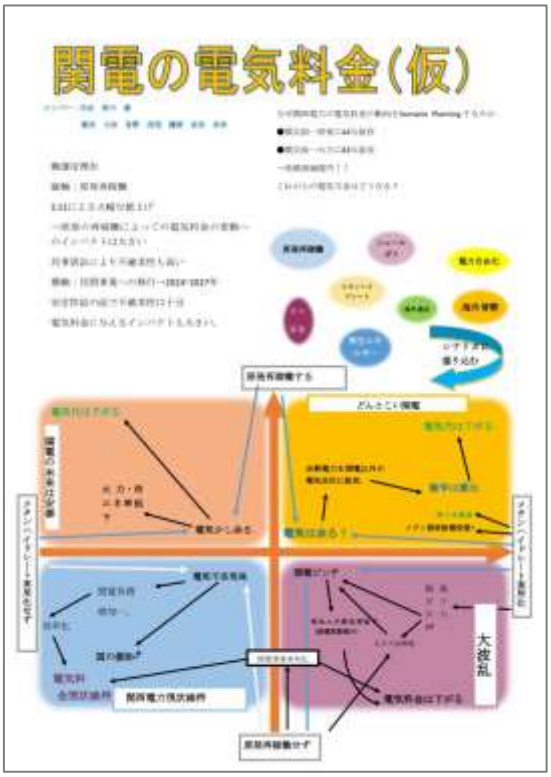


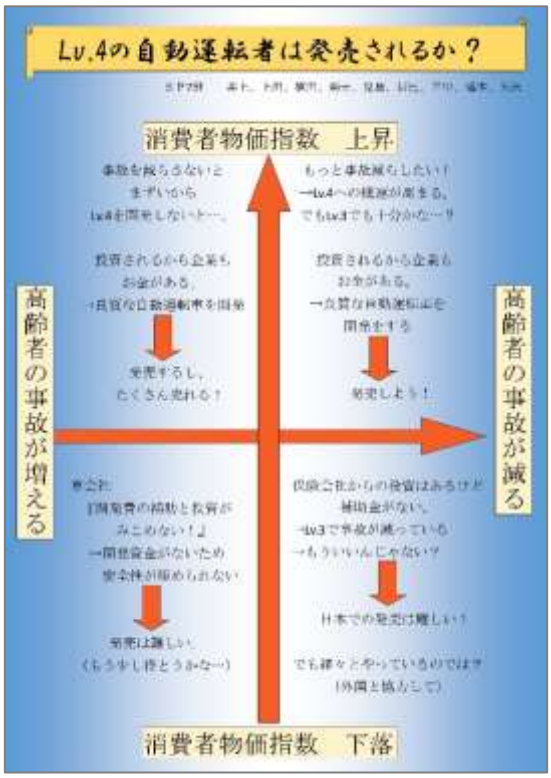
《3 年生》

	月	STEP		その他
第三年次	4	SP	GE	講演会 特別授業
	5			
	6			
	7,8			
	9	課題研究発表準備		
	10			
	11	**課題研究発表**		
	12	**論文作成･発表**		
	1			
	2			
	3			

国際シンポジウムの後も各班はSPを進め、場合によっては2軸の取り方も変えた新たなSPのポスターを2017年2月23日の中間発表会で発表した。以下がそれであるが、最終的に論文にまとめられたものに近いと思われる。







なお、中間発表会では「SGH 甲子園」に出場した 1 班のみ舞台でプレゼン発表を行ったので、その班のポスターはない。

第Ⅱ章

SP 卒業論文のまとめ

１．シナリオ・プランニングの統一テーマ

エネルギー

２．各班の内容（概略）について

「概略」の構成は次の様になっている

トピック

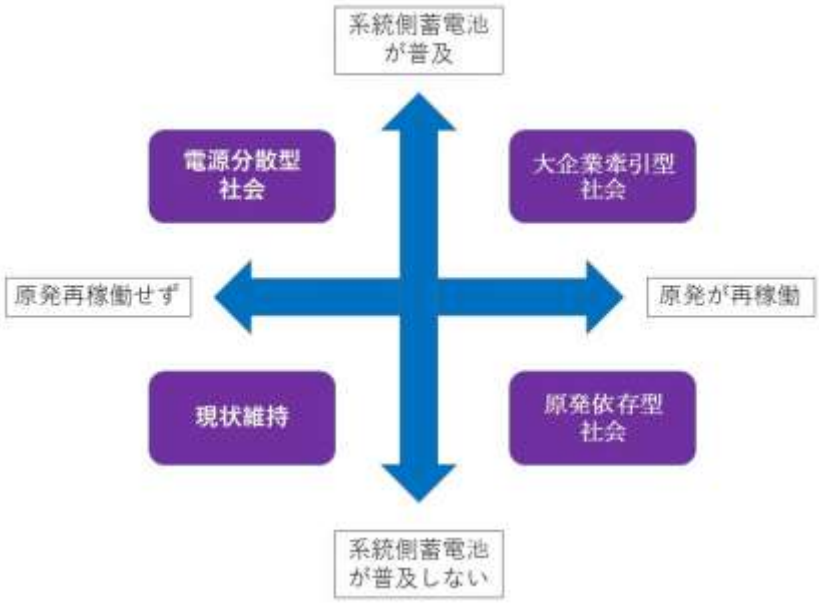
DF（ドライビング・フォース）

SP マトリックス模式図

①トピックの選定理由(英文)
②トレンドの動向(英文)
③X軸選定理由(英文)
④Y軸選定理由(英文)

４つの象限のシナリオ(英文)

第１班	
トピック	2030 年の日本の電力とスマートグリッド
DF(ﾄﾞﾗｲﾋﾞﾝｸﾞ・ﾌｫｰｽ)	「原子力発電所の再稼働」「系統側蓄電池の普及」
SP ﾏﾄﾘｯｸｽ模式図	注 ■ は、各象限の「シナリオ・タイトル」



①Topic

We had the shortage of electricity when the Tohoku earthquake occurred, even though Japan's electricity supply was stable. However, we have found a new electricity supply system called "Smart Grid," which is outstanding in terms of stability of electricity supply. It will also contribute to the reduction of CO_2 emission. These are the reasons why we chose "Smart Grid" as our topic.

②Trends

We picked up the following three factors as the trends:

1) The Spread of Energy Harvesting System

Energy harvesting is a system where we can change external energy sources, such as solar energy and vibration of bridges, into electricity.

2) Various Efforts and Actions to Preserve the Environment

3) The Effect of Declining Population on the Consumption of Electricity

It is often said that the demand of electricity will decrease as the population falls, but this is not true because the demand of electricity is determined by the social and economic situation, rather than population.

③The Reason for Choosing the X Axis

It is obvious that if nuclear power plants are restarted, electricity rates will become lower and it will have a great impact on the spread of Smart Grid. On the other hand, since nuclear power plants have many risks, many people are opposed to starting them again, which means it is quite uncertain if they will be restarted.

④The Reason for Choosing the Y Axis

If large-scale storage batteries spread, renewable energy supply will become stable, which will be closely related to the spread of Smart Grid. However, today there are few large-scale batteries because of their high price, so whether they will be widely spread or not depends on technological advancement, which is very uncertain.

The 1st Quadrant

Large electric companies lower electricity rates because their nuclear power plants are restarted and smaller companies are overwhelmed. These large companies utilize large-scale storage batteries to distribute surplus electricity more efficiently. Since people want to benefit from this situation, Smart Grid will be widely spread. Smart Grid involves a lot of information transmission and it has a vast amount of private data, so the security against cyber-terrorism is strengthened.

The 2nd Quadrant

The amount of energy consumption varies in each season and it has a bad effect on an electric power network. In order to avoid that, electric companies need to constantly check the amount of energy consumption. Since large-scale storage batteries are available, they can control the data by introducing Smart Grid, which makes it possible to use electricity even when a disaster occurs. Besides, since nuclear power plants are not restarted, the Japanese government promotes electric power generation by using renewable energy. As a result, eco-friendly and disaster resilient society will be realized.

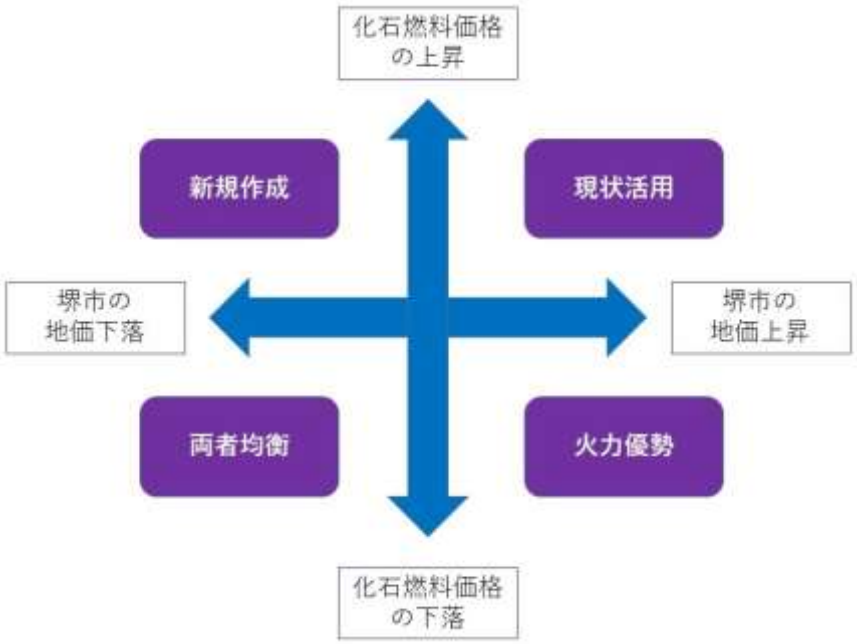
The 3rd Quadrant

Since nuclear power plants are not restarted, electricity generation has to depend on thermal power generation, which emits a lot of CO_2. The Japanese government tries to promote renewable energy generation by introducing various supporting systems. These systems enable smaller electric companies to compete with larger electric companies. However, since both large and small electric companies cannot realize stable energy supply, the energy supplying system will remain the same as it is now.

The 4th Quadrant

Since large-scale storage batteries are not available, it is difficult to depend on electric power generation by using renewable energy sources. Electric companies reduce the investment in the establishment of new power plants that utilize renewables. They try to find effective ways to utilize existing power plants efficiently. Since nuclear power plants are already restarted, they will continue to depend on nuclear power generation.

第２班	
トピック	2030 年度の堺市におけるエネルギーの地産地消について
DF(ﾄﾞﾗｲﾋﾞﾝｸﾞ・ﾌｫｰｽ)	「化石燃料価格の変動」「住宅用地価の変動」
SP ﾏﾄﾘｯｸｽ模式図	注 ■ は、各象限の「シナリオ・タイトル」



①Topic

Since the Fukushima nuclear accident in 2011, the demand for alternative energy sources has been growing. Here, our team discussed the future of power generation and consumption in Sakai City, where half of our team members live.

②Trends

Among many DFs, we chose the following factors as trends, which have a great influence on the scenario of each quadrant. The entry of new electric companies, VPPs (Virtual Power Plant), solar power generation, biomass power generation and nuclear power generation.

③The Reason for Choosing the X Axis

There are a lot of clean energy sources, but solar power generation accounts for the largest amount and we focus on it. Increasing the amount of solar power generation requires large areas of land. Therefore, the price of land has a great impact, and it is very difficult to predict its changes.

④The Reason for Choosing the Y Axis

The reason why we chose the price of fossil fuels is that Sakai City depends largely on thermal power generation for generating electricity and it mainly uses Liquefied Natural Gas (LNG). Therefore, it greatly affects the generation of electricity and its changes are unpredictable.

The 1st Quadrant

Due to the rising price of fossil fuels, Sakai City decreases the amount of electricity generated in thermal power plants. At the same time, Sakai City does not build new big solar power plants or new hydraulic power plants because of the rising price of land. In such a situation, the introduction of the VPP system becomes important. VPPs enable us to connect each generation system with our houses and factories, and we can decrease the amount of wasted electricity. As a result, Sakai City will introduce the VPP system to use electricity efficiently.

The 2nd Quadrant

In this quadrant, the rising price of fossil fuels makes Sakai City introduce more alternative energy sources. It provides subsidies for generating electricity by using renewable energy sources. Since the price of land decreases, the number of new houses built in Sakai City is increasing. Thanks to the subsidies, these houses are equipped with solar panels or with a device for small hydraulic power generation. In addition, Sakai City introduces VPPs to effectively use electricity. Furthermore, Sakai City will try to become an ideal town which is resilient to disasters.

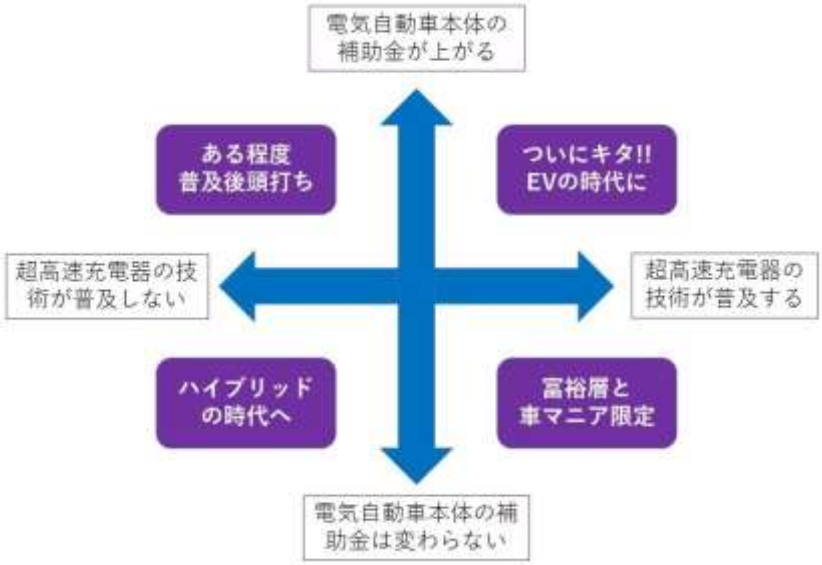
The 3rd Quadrant

In the third quadrant, since the price of fossil fuel has dropped, the amount of thermal power generation is still large in Sakai City, which is against its policies. Sakai City is designated as an Eco-Model City by Promotion Council for the "FutureCity" Initiative, so it has to promote clean energy generation. Since the price of land has also dropped, Sakai City tries to spread solar power generation. It provides subsidy for solar power generation and encourages people to have their houses equipped with solar panels. It also introduces the VPP system to use electricity more efficiently. However, the amount of electricity produced by thermal power generation and other power generation by using renewables is almost the same.

The 4th Quadrant

In this quadrant, since the price of fossil fuels has dropped, the amount of thermal power generation is large. At the same time, since the price of land in Sakai City has risen, the number of new houses is not increasing and that of apartment houses is increasing. In this situation, small hydraulic power generation, which can be installed in apartment houses, is promoted more than solar power generation. However, the amount of electricity produced by small hydraulic generation is small, compared to that by solar power generation, so Sakai City introduces the VPP system. On the other hand, Sakai City has a biomass power plant and it can generate electricity more stably than solar power generation. Sakai City tries to increase the amount of electricity produced there, but it is quite limited and it is impossible to build a new biomass power plant. In conclusion, the amount of thermal power generation remains large and the rate of renewable energy does not become high.

第３班	
トピック	日本における電気自動車が７年後普及するか
DF(ﾄﾞﾗｲﾋﾞﾝｸﾞ・ﾌｫｰｽ)	「超高速充電器の技術の普及」「電気自動車本体の補助金」
SP ﾏﾄﾘｯｸｽ模式図	注 ■ は、各象限の「シナリオ・タイトル」



①Topic

Among all the environment-friendly cars, EV (Electric Vehicle) sales have been increasing year by year. However, how much the price of the vehicle itself will be and how widely the technology will spread are very uncertain, so the amount of sales cannot be expected. Uncertainty of the sales of EVs would be appropriate for our scenario planning and this is why we chose this topic.

②Trends

Rental car and car sharing systems will spread. EVs, ZEVs (Zero Emission Vehicle) and automatic driving vehicles will also spread widely. There will be changes in public transportation. While in rural areas more and more public transportation will disappear, in urban areas more public transportation will be established. The regulation on diesel cars will be continued. More and more compact cities will be built and more alternative energy will be introduced.

③The Reason for Choosing the X Axis

According to the recent research, it takes at least 30 minutes to charge EVs. This makes people reluctant to buy them. However, since companies have been trying to invent new technology, this problem might be solved, but it is not certain.

④The Reason for Choosing the Y Axis

If the price of EVs goes down, more people will want to buy them, and it depends greatly on the amount of subsidies. Subsidies reflect the intention of the Japanese government, which wants to reduce the emission of CO_2. However, the amount of subsidies is affected by the economy, which is uncertain.

The 1st Quadrant

The ultra-fast charger is invented and has spread, so it has solved the weakest point of electric cars and accelerated customers' interest in them. In compact cities, the public transportation system is improved, and so there are few households which have their own cars. However, rental car and car sharing systems are developed for sightseers who go to the country. On the other hand, in other cities, there are a lot of households which use electric cars because the ultra-fast charger is spreading. EVs are equipped with the autonomous driving system for the elderly. For the reasons above, a lot of electric cars will be used in Japan and electric mobility society will be implemented.

The 2nd Quadrant

Though the price of EVs goes down, it still takes a long time to charge them. Therefore, they will become popular among homemakers, who have enough time to spare. Expanding charging stations is necessary to promote the popularization of EVs, so more charging stations will be established. Considering that homemakers will account for a large part of the EV users, charging stations will be built mainly in parking areas of supermarkets and coffee shops. However, EVs will not become popular among people except homemakers, so the popularization of EVs will be limited.

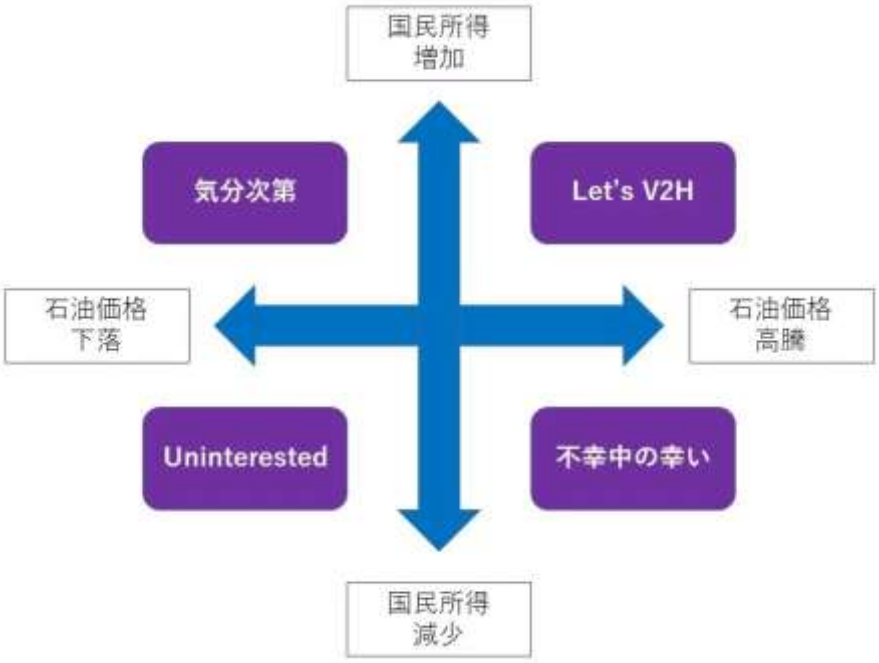
The 3rd Quadrant

Today, the number of young people has been decreasing and the number of old people has been rapidly increasing in Japan. In addition, young people tend not to have their own cars because of the economic depression and the development of transportation networks. For these reasons, the number of car owners in Japan has been declining. In such a situation, unless we make drastic improvement in EVs or the Japanese government changes its policy on them and increases the amount of subsidies, the number of EVs will gradually decrease. However, people are more concerned about the environment, and the Japanese government has been taking various policies to decrease the CO_2 emission, so hybrid cars will be widely used.

The 4th Quadrant

Even though the ultra-fast charger is developed, the price of EVs is high. Therefore, only wealthy people can afford them. In addition, the German Bundestag has decided to prohibit selling gasoline and diesel cars. Some other European companies will also take this policy. Since European cars are popular in Japan, people who love them will buy European EVs. On the other hand, Japan is a super aging society, so compact cities are developed in rural areas. In compact cities, EVs are more likely to be used for transportation because people don't have to move a long distance there. In conclusion, the number of European EVs and EVs in rural areas will increase, but most people will wait until EVs become cheaper.

第４班	
トピック	15 年後の日本における V2H(Vehicle to Home)の普及
DF(ﾄﾞﾗｲﾋﾞﾝｸﾞ・ﾌｫｰｽ)	「石油価格の変化」「国民所得の増減」
SP ﾏﾄﾘｯｸｽ模式図　注	は、各象限の「シナリオ・タイトル」



①Topic

Nowadays, environmental problems have become more and more serious. V2H (Vehicle to Home) is one of the new technological innovations which is expected to prevent the present situation from getting worse. Therefore, we have decided to examine the spread of V2H.

②Trends

Since we have to be prepared for earthquakes and protect the environment, the Japanese government will be promoting the spread of V2H. Thanks to technological innovation, the prices of the products related to this SP will have become lower

③The Reason for Choosing the X Axis

The price of petroleum is unstable because it depends on many factors, such as many countries' economy, international relationships and so on. Furthermore, it affects electricity rates, which is profoundly related to Electric Vehicles (EV) and the purchase of V2H.

④The Reason for Choosing the Y Axis

In order to purchase V2H, people need to have a decent income. Moreover, national income (NI) and the economy are greatly connected, and when the economy is good, the spread of V2H may be accelerated. In addition, the changes of NI cannot be predicted.

The 1st Quadrant

The scenario of the first quadrant is the most desirable for the spread of V2H. Since the price of petroleum has risen, both the price of gasoline and electricity rates are rising. In such a situation, people are more interested in private power generation. In addition, since people have a decent income, they pay more attention to preparing for earthquakes, which encourages them to introduce the private power generation system. As a result, V2H will widely spread. Considering the trend mentioned in the previous page, there is a strong possibility of the government enforcing this policy, which will accelerate the sales of V2H.

The 2nd Quadrant

If the price of petroleum becomes lower and the national income of Japan rises, EVs and PHEVs (Plug-in Hybrid Electric Vehicle) will spread in 15 years. This is because the decrease of the price of petroleum means that electricity rates will decrease and the price of EVs will be lower, thanks to the improvement of technology. Then V2H and all-electric homes will spread because people can afford to refurbish their homes. In this situation, main energy will change from petroleum to electricity. Therefore, the emission of CO_2 will decrease and sustainability of society will be enhanced.

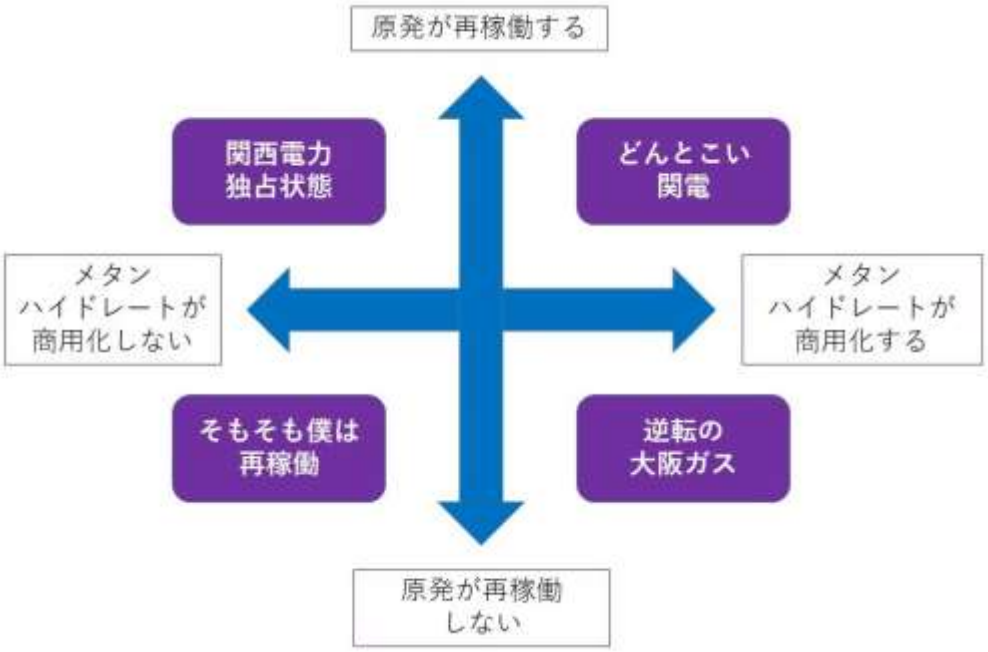
The 3rd Quadrant

In this quadrant, the price of petroleum falls and national income decreases. In this case, electric vehicles will spread, but V2H won't spread so much in 15 years. This is because the price of electric vehicles will become lower and lower, and most people won't be able to afford V2H. In this situation, electric vehicles will be unable to play their expected roles. Therefore, many attempts to utilize electric vehicles will be done by trying to apply V2X(Vehicles to Everything) to Japanese society. Although V2H will not spread easily, these attempts will help create the trend toward making electric vehicles utilized more in society.

The 4th Quadrant

In this quadrant, the price of petroleum rises and national income decreases. Due to the sharp rise in the price of petroleum, the price of gasoline rises and people have more interests in electric cars and hydrogen cars. However, under the circumstances where electricity rates have jumped and national income has decreased, few people can afford to buy these cars. Furthermore, research shows that only a small number of people without their own houses plan to own one. Besides, the percentage of unmarried people has been increasing. For these reasons, the number of people who don't have their own house increases, which will prevent V2H from spreading. In conclusion, although the spread of V2H is expected to a certain extent, it is less than that in the first and second quadrants.

第５班	
トピック	15 年後の関西電力の電気料金
DF(ﾄﾞﾗｲﾋﾞﾝｸﾞ・ﾌｫｰｽ)	「原発が再稼働する」「メタンハイドレートが商用化する」
SP ﾄﾘｯｸｽ模式図　注	は、各象限の「シナリオ・タイトル」



①Topic

Electricity rates have a great impact on our lives, but now many factors, such as nuclear power plants, deregulation, and the development of new energy, affect electricity rates. This is why we focused on the future of Kansai Electric Power Company(KEPC), a leading electric company in Japan.

②Trends

Electric companies are most likely to regulate CO_2 emission, promote the deregulation of electric power industry, and face the decline in domestic electricity consumption.

③The Reason for Choosing the X Axis

Whether nuclear power plants will be restarted or not is quite uncertain because it depends on the public opinion and the results of the lawsuits. Restarting them will bring electric companies great profits that can completely change the market state.

④The Reason for Choosing the Y Axis

It is uncertain when the technology for mining methane hydrate around Japan will be developed, but if it becomes available, it will be an important energy source that makes it possible for us to become independent of Middle East and realize less CO_2 emission.

The 1st Quadrant

Before 2011, Kansai Electric Power Company (KEPC) depended on their nuclear power plants. However, now, due to the Great East Japan Earthquake, they have to depend on thermal power generation that costs more than nuclear power generation. In this quadrant, where the nuclear power plants are restarted and methane hydrate is commercially utilized, KEPC will be able to make a lot of profit, depending more on their nuclear power plants and combined cycle power generation. KEPC will reduce their electricity rates so that they can keep their customers. Besides, KEPC will take social situations and the Japanese market into account, and try to reinforce various kinds of business projects in order to make a greater profit.

The 2nd Quadrant

If KEPC can restart their nuclear power plants and methane hydrate around Japan is not available in 15 years, they cannot lower electricity rates greatly. In this case, new electric companies will have to use thermal power generation that costs more than nuclear power generation. On the other hand, KEPC can use their nuclear power plants, but they cost a lot to maintain because they have to prepare for an accident like Fukushima. Therefore, they will lower electric rates a little so as not to lose their customers and new electric companies will fall in a difficult financial situation. After 2031, KEPC will shift their thermal power generation to combined cycle power generation, and expand business, including telecommunications and international trade, to make a greater profit.

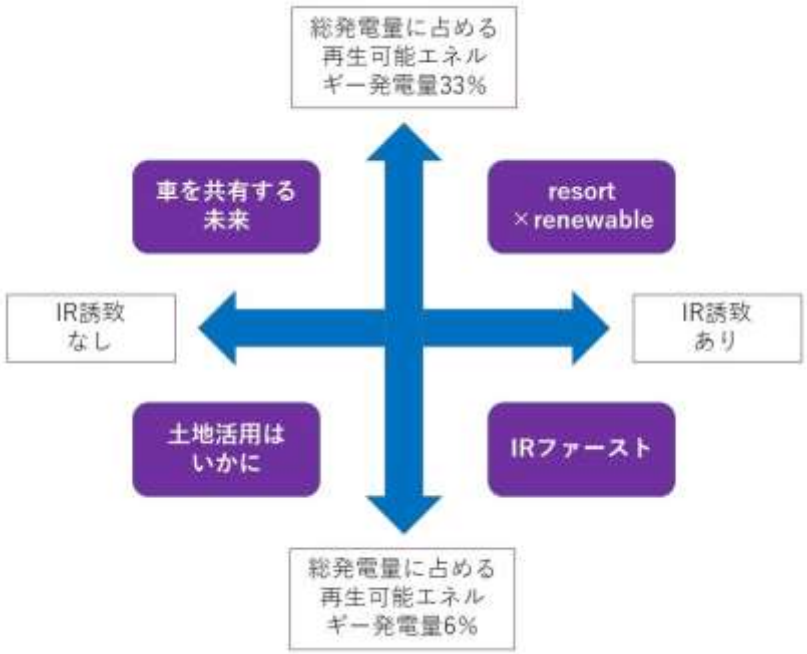
The 3rd Quadrant

If KEPC cannot restart their nuclear power plants (NPP) and methane hydrate around Japan is not available, KEPC have to cover the great cost of the maintenance of nuclear power plants and the fuel for thermal power generation. Therefore, electricity rates remain high and they will lose their customers. However, they will not give up restarting the NPP, which can make a huge profit. In order to make up for the cost, KEPC will expand its business abroad or enlarge the size of business other than electricity, such as gas, but the profit will not be enough to lower their electricity rates.

The 4th Quadrant

If nuclear power plants of KEPC are not restarted and methane hydrate around Japan is available, KEPC will be in a bad financial situation. This is because they do not have enough money to mine methane hydrate due to the maintenance cost for their nuclear power plants. Therefore, KEPC have to start new businesses in order to compete against Osaka Gas. If KEPC begin some new businesses, they can gain as much profit as Osaka Gas can. Therefore, the price competition will occur and electricity rates will go down.

第６班	
トピック	2030 年における大阪府の交通システム
DF(ﾄﾞﾗｲﾋﾞﾝｸﾞ・ﾌｫｰｽ)	「IR(統合型リゾート)の誘致」 「再生可能エネルギーの普及率」
SP ﾏﾄﾘｯｸｽ模式図　注	は、各象限の「シナリオ・タイトル」



①Topic

The reason why we have chosen this topic is that we think the transportation system will be more and more developed by the progress of science technology. Recently, the government of Osaka has been trying hard to host Integrated Resorts and increase the number of visitors from abroad.

②Trends

1. The decrease in demand for gasoline
2. The tendency for people to spend more money experiencing what they are interested in than buying things.
3. The spread of automatic driving systems

③The Reasons for Choosing the X Axis

There are mainly two reasons why we chose whether or not the IR invitation is successful as the X axis. First, it is very uncertain whether or not it is successful. Second, tax revenues and the number of foreign people visiting Osaka will dramatically increase if the IR invitation is realized, which will have a great impact on the transportation system in Osaka.

④The Reason for Choosing the Y Axis

The reason why we chose as the Y axis whether or not electric power generation by renewable resources accounts for 33% of gross generation is that it is very difficult to produce electricity by utilizing such resources because the climate is not suitable enough and the land is not large enough to do that. Therefore, it is very uncertain. It also has a great effect on the transportation system in Osaka because transportation systems are closely related to electricity and other energy.

The 1st Quadrant

Since renewable energy spreads, the way people commute and the way people visit Osaka will change. Besides, since the IR invitation project is successful, investments from various people, companies and local governments will increase. Therefore, local governments will cooperate with companies to provide various services that enable people, commodities, and money to flow smoothly.

The 2nd Quadrant

Since the IR project isn't successful, the number of people who come to Osaka will not increase as remarkably as is expected. In addition, different commercial facilities will be built at the place where the IR was expected to be established. In contrast, because of the wide spread of renewable energy sources, we will be more conscious of the significance of protecting the environment. Therefore, nongovernmental efforts, such as introducing the car sharing system or using electric cars, will be made.

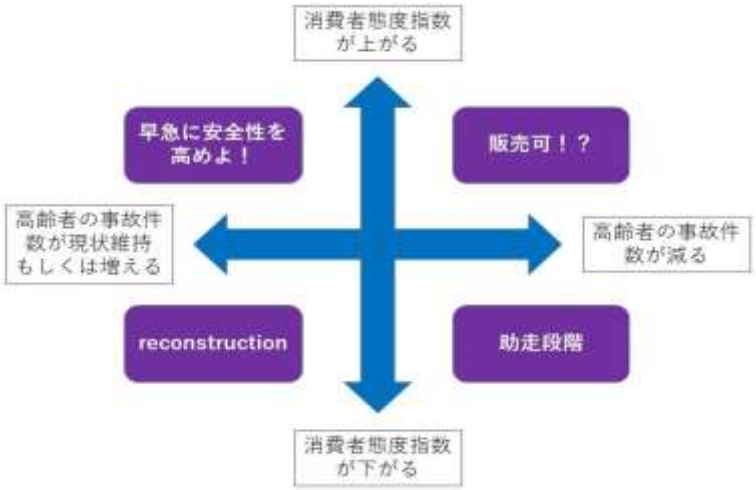
The 3rd Quadrant

Since the IR project is not successful, the government of Osaka must build other large commercial facilities. However, the number of people who visit Osaka has not increased dramatically. In addition, since renewable energy is not popular, the transportation system of Osaka will not change so much, and the number of HVs (Hybrid Vehicle) and other eco-friendly cars will remain the same as now.

The 4th Quadrant

New facilities and a new public transportation system will be introduced because the success of the IR invitation will raise the number of people who visit Osaka. However, renewable energy has not spread in society, so the number of trains, electric cars, and so on, which depend on electricity, will not increase. Therefore, it is thought to be important to figure out how to increase the number of passengers who use the public transportation system. As a result, the convenience of the public transportation will be regarded as more important than the preservation of the environment.

第７班	
トピック	2030 年に完全自動運転車は販売されるのだろうか？
DF(ﾄﾞﾗｲﾋﾞﾝｸﾞ・ﾌｫｰｽ)	「高齢者の事故件数が減ったかどうか」 「消費者態度指数が 2017 年 3 月より上がるかどうか」
SP ﾏﾄﾘｯｸｽ模式図	注 は、各象限の「シナリオ・タイトル」



①Topic

Many car companies have announced that they will start selling Level 3 SDCs (Self-Driving Car) in 2020. A Level 3 SDC is a car that handles all the driving by itself though a person must be in the driving seat in case an accident might happen. The car companies have been trying to produce Level 4 SDCs, which autonomously drive themselves without any assistance of humans. The realization of such cars will greatly change our way of living and working. This is why we have chosen this topic.

②Trends

1)In 2014, TOYOTA started to collaborate with PFN, a company that does research and development on the technology of AI, and they have been improving AI technology since then. They have already succeeded in enabling AI to learn by itself. This technology will be introduced to producing SDCs.

2)The system called “OTA”, which is a countermeasure against cyber-attacks, was already invented. In addition, some other countermeasures are under development. These are the ones that AI will employ by itself without waiting for human directions when it comes under cyber-attacks.

③The Reason for Choosing the X Axis

We set “Whether or not the number of traffic accidents caused by elderly people will be smaller than that in 2016” as the horizontal axis. This number is closely related to the safety of Level 3 SDCs, and as a result, it will have a huge impact on whether Level 4 SDCs will be sold or not. This number shows how greatly advanced Level 3 SDCs will be and nobody is sure about how quickly SDCs will develop.

④The Reason for Choosing the Y Axis

We set "Whether or not consumer confidence index will be better than that in 2017" as the vertical axis. It is affected by the economy and strong economy provides car companies with a lot of money to develop Level 4 SDCs and the index can be said to show how much people want to purchase them. At the same time, nobody can tell whether the economy will get better or worse.

The 1st Quadrant

In the 1st quadrant, the consumer confidence index is higher than that in 2017 and the number of traffic accidents caused by elderly people is smaller than that in 2016. People will want to buy SDCs and the Japanese government and other companies invest more in developing SDCs. This is because people have a decent income and people trust SDCs. The small number of accidents means the spread of Level 3 SDCs, and it will inspire car companies to develop Level 4 SDCs.

The 2nd Quadrant

In the second quadrant, the consumer confidence index is good and the number of accidents caused by elderly people is large. The large number of accidents means that there are many errors in the systems of Level 3 SDCs, so consumers have lost trust in Level 3 SDCs. However, it is thought that Level 1 and 2 SDCs will have been proved to be safe, so some people purchase these SDCs since they can afford them. Others wait for Level 3 SDCs to be improved. In such a situation, business results of car companies are worse than those in the 1st quadrant, but they are expected to be better than those in the 3rd and 4th quadrants. Therefore, car companies have enough funds and try very hard to improve Level 3 SDCs.

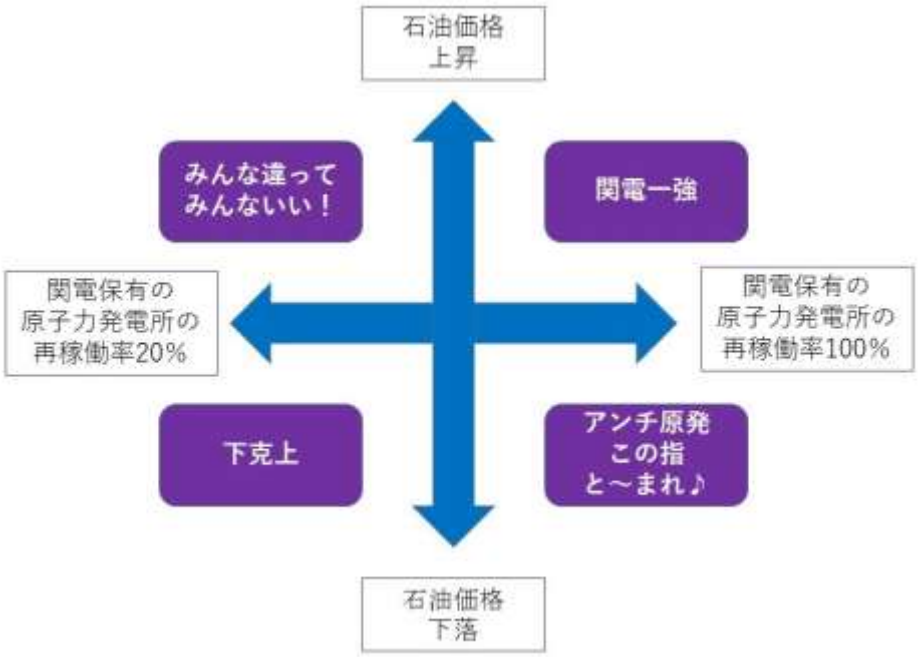
The 3rd Quadrant

In this quadrant, people have lost trust in Level 3 SDCs because of the large number of accidents caused by elderly people who use them. Car companies try to improve them, but due to weak economy, they have to reduce their work force or make their businesses smaller to have enough funds. They also try to sell Level 1 and 2 SDCs again. It takes a lot of time to improve Level 3 SDCs and the development of Level 4 SDCs will not easily be realized.

The 4th Quadrant

In this quadrant, the consumer confidence index is low and the number of accident caused by elderly people is small. Car companies try to develop Level 4 SDCs. However, since the economy is slowing down, it is difficult to have enough money to develop them. At the same time, the trust in Level 3 SDCs makes it possible for companies to get a loan from banks and the subsidy from the government to develop Level 4 SDCs. In such a situation, even if Level 4 SDCs are developed, their price will be high. In conclusion, car companies make an effort to sell Level 3 SDCs and wait until the economy becomes strong and Level 4 SDCs are likely to be sold.

第８班	
トピック	2030 年度の大阪ガスの関西圏での家庭電力におけるシェア
DF(ﾄﾞﾗｲﾋﾞﾝｸﾞ・ﾌｫｰｽ)	「石油価格の上昇・下降」「関電保有の原子力発電所の再稼働率」
SP ﾏﾄﾘｯｸｽ模式図	注 ■ は、各象限の「シナリオ・タイトル」



①Topic

We focused on how much electricity rates will be when we become 30 years old. Sales share has a great impact on them, and Osaka Gas Co.(OGC) has been competing with Kansai Electric Power Co.(KEPC). This is why it would be interesting to think about the share of OGC in Kansai area.

②Trends

Liberalization of electricity retailing, which started in April, 2016, will make the competition among many power companies so intense, and the yield and distribution of shale gas affect the price of Liquefied Natural Gas(LNG).

③The Reason for Choosing the X Axis

The re-operation of nuclear power plants reduces electricity rates and affects other companies, so its impact is big. Judiciary decisions, economy and politics affect the re-operation of nuclear power plants, so its uncertainty is high.

④The Reason for Choosing the Y Axis

Since the rate of thermal power generation of OGC is quite high (90%), the swing of the petroleum price will greatly affect its electricity rates. In addition, it is very difficult to predict how much shale gas will be imported and how the situation of the Middle East will change.

The 1st Quadrant

In this quadrant, KEPC has flourished among other companies because it has many nuclear power plants and lowers its electricity rates. OGC struggles to lower its electricity rates and depends more on shale gas, which is relatively inexpensive. At the same time, OGC makes campaigns against nuclear power plants. However, the effect of the high price of petroleum is so great that OGC cannot compete with KEPC. The same is true of other companies. Giving up competing with KEPC, OGC tries to provide other services like "EneFarm" and carries out overseas business projects. In conclusion, the share of OGC in Kansai area will increase only slightly.

The 2nd Quadrant

When the price of petroleum goes up and the nuclear power operation rate is 20%, it is difficult for all companies to lower their electricity rates. KEPC has a hard time because their nuclear power plants cost a lot for maintenance. In this situation, OGC and other companies tie up with one another, and OGC, cooperating with Tokyo Gas Co., tries to buy LNG and shale gas at a low price. OGC also tries to appeal to its customers with its unique plans, such as "EneFarm." Other companies, too, appeal to consumers with their own plans. Considering these conditions, OGC will increase its share, but it has to prepare for the time when nuclear power plants of KEPC are started again.

The 3rd Quadrant

In this quadrant, the price of petroleum is low, so electric companies, including OGC, lower their electricity rates. OGC provides the "all electric house plan", and KEPC tries to provide a similar plan, but it cannot. This is because KEPC has to spend a lot of money on the maintenance of their nuclear power plants. On the other hand, the Japanese government will take various policies to reduce CO_2, which encourages electric companies to develop power generation systems by renewables. In this way, while KEPC has a hard time keeping their customers, OGC and other companies prosper. In conclusion, OGC will increase its share considerably.

The 4th Quadrant

When all the nuclear power plants KEPC possesses are restarted and the price of petroleum has dropped, it can supply electricity at a very low price and have a large share. As for OGC and other companies, they try to compete with KEPC, providing their own plans, such as "EneFarm", thanks to the low price of petroleum. They also cooperate with each other to make campaigns against nuclear power plants. However, in such a situation, it is very difficult for them to acquire new customers and KEPC keeps its customers. In conclusion, OGC may be able to increase its share because of its unique plans, but the increase is very limited.