

A History of the Energy Minerals Division of the AAPG (1968-Present)

by

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Preface

In 1977, AAPG celebrated the 100th anniversary of its founding in Tulsa, Oklahoma. This same year was also the 40th anniversary establishing the AAPG Energy Minerals Division (EMD). The EMD has evolved as an organization over the past 40 years reflecting the changes in the mix of resources fueling the world's ever increasing energy demand. We look forward to serving AAPG and our Division members by continuing to promote the geological sciences related to unconventional and alternate energy resources which will be required to meet the global challenges of providing a sustainable energy future. The purpose of this article is to celebrate the 40th anniversary by providing a brief history of the founding and evolution of the EMD that may serve as a reference and guide for future EMD members and leadership.

From Conception to Division (1968-1977)

Forty-one years ago on June 12, 1977, the Energy Minerals Division (EMD) was created by the AAPG Executive Committee. The early history of the EMD, recalled by Samuel Friedman ("From Mining to Hydrates: 21 years of EMD's History Cited", *AAPG Explorer*, May, 1998), is included below. EMD had its early beginnings at the 1968 AAPG annual meeting in Oklahoma City, with a "Fuels Symposium" on coal, shale oil, tar sands, nuclear fuels, geothermal energy, and oil and gas. Then in 1969, AAPG President Frank B. Counselman appointed an *ad hoc* "Committee for Proposed Division of Mineral Economics," and he named Tom C. Hiestand as chairman, who is credited as being the first person to suggest and work for Division status.

In 1970, AAPG President Kenneth H. Crandall appointed a special "Committee on Mineral Economics Symposium," and he named Hiestand as its chairman. This committee organized a program of eight speakers for the 1970 AAPG annual meeting in Calgary. Among the speakers, whose papers were published in the June 1971 AAPG Bulletin, were Michel T. Halbouty and Hollis M. Dole (Assistant Secretary of the Interior).

Reappointed by AAPG President William H. Curry Jr., the committee produced only one invited paper at the 1971 AAPG annual meeting in Houston. The next year the program was expanded to include representatives of other fuel and energy disciplines. The committee produced a half-day symposium consisting of seven papers at the 1972 annual meeting in Denver, which were

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published in 1973 by the Mineral Economics Institute at Colorado School of Mines (John A. Pederson and Tom Hiestand were editors).

The two themes covered in this symposium were:

1. National mining and minerals policy,
2. Economic incentives and deterrents affecting exploration and development of fuels/energy group of mineral resources during 1970-1973.

The Committee on Mineral Economics was reappointed for the 1972-73 year, with Siegfried Muessig as chairman. For the 1973 AAPG annual meeting in Anaheim, the Committee organized an all-day symposium with 13 talks on "Economics of Energy Minerals." Having coined the term "energy minerals," the Committee on Mineral Economics now recommended it be renamed "The Committee on Energy Minerals," and it was reconstituted as such in the fall of 1973 under Chairman John A Pederson.

Transferred from "special" to "standing" status in 1974, the Energy Minerals Committee moved one step closer to becoming a division. Mr. Pederson chaired the Committee on Energy Minerals for two years and planned for future programs and leadership. At the 1974 AAPG annual meeting in San Antonio, the committee presented a symposium on "Energy Minerals - What Are the Producible Reserves?"

At the 1975 AAPG annual meeting in Dallas, the committee presented a symposium on "Energy Minerals: Status and Role," with talks emphasizing geothermal energy and uranium. Pederson, in a renewed effort to achieve division status, asked R.C. Millspaugh to devise a questionnaire for polling all AAPG members as to the need for a "division." This questionnaire was completed and mailed in early 1976 when Loyd Carlson was committee chairman. The questionnaire's results showed resounding support for a division that would gather and present papers on energy minerals in the AAPG Bulletin and at AAPG annual conventions. About 50 percent of respondents asked for short courses and field trips. Carlson was named chairman of the Energy Minerals Committee, presiding over the committee's work, which produced two more successful symposia:



1. At the 1976 AAPG annual meeting in New Orleans, under program chairman Ruffin I. Rackley, and
2. At the 1977 annual meeting in Washington, D.C., under program chairman Robert L. Fuchs, who coordinated presentation of 40 papers.

Ed R. Turner (1977, AAPG Bulletin, pp. 30-31) reported that the AAPG Executive Committee approved bylaws for a division, and at the 1977 annual meeting the House of Delegates in

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Washington, D.C. passed a resolution that division status be approved by the Executive Committee. Thus on June 12, 1977, the Committee on Energy Minerals became the Division of Energy Minerals (EMD). At this time, upon recommendation of a Nominating Committee, Carlson became the first EMD president, Warren H. Westphal the first vice president, and Ruffin I. Rackley the first secretary-treasurer - and by the end of June 1977, approximately 757 AAPG members had paid \$10 each to join the new division as founding members.

The First Decade

Tom Hiestand was named an EMD "Distinguished Founder" at the 1978 annual meeting in Oklahoma City. This honor was extended to Mr. Pederson and Mr. Hollis M. Dole in 1979; to Mr. Carlson, Muessig, Westphal, Donald W. Axford, William R. Moran and Harry L. Thomsen in 1980; to Ruffin I. Rackley and Mr. Fuchs in 1993; to Samuel A. Friedman in 1994; and to Donald F. Towse in 1996.

EMD held its first annual program as a new AAPG division at the 1978 meeting. Councilor Samuel A. Friedman, assisted by Lawrence L. Brady and others, coordinated the program, consisting of 28 research papers that filled two oral sessions on uranium geology, one oral session on coal geology, and a fourth oral session on geothermal energy and tar sands. Two papers on coal geology were presented in an AAPG poster session.

Carlson and the EMD Program Committee established best-paper awards based on a rating system patterned after the AAPG Matson Award. Awards were presented at the next annual meeting. At later annual meetings, EMD added best poster awards - and both categories of awards continue to be made annually. Both the Eastern and Rocky Mountain Sections of AAPG also initiated EMD awards for both categories of papers at their annual conventions.

In 1978, David G. Campbell, AAPG annual meeting field trip chair, invited Mr. Friedman to plan and lead a two-day coal geology field trip to the Arkoma Basin in eastern Oklahoma. Thus, AAPG Field Trip No. 2, with guidebook and 38 participants, became the first EMD-organized pre-convention field trip. Zuhair Al-Shaieb, with guidebook and a full bus, also led a field trip that examined uranium mineralization in parts of the Anadarko and Hoilis basins and the Wichita Mountains in southwestern Oklahoma - the first post-convention field trip on an EMD topic. Co-sponsoring special programs outside of AAPG annual meetings was begun by the former AAPG Committee on Energy Minerals, which had co-sponsored with sections of A.I.M.E. a symposium on "In-Situ Leaching of Uranium," held at Vail, Colo., in August 1976.

The Division also was the primary sponsor of a highly successful symposium on the Grants, N.M., uranium area, chaired by Frank E. Kottlowski, in May 1979. In two and a half days, an unprecedented 48 papers on uranium geology were presented. EMD received a record \$10,000 in net revenue from registrants at this symposium.

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EMD co-sponsored the 1980 Rocky Mountain and Southwestern Section annual meetings. Phil Goodell chaired the El Paso symposium, at which 28 EMD papers covered uranium topics and two successful field trips were given to investigate uranium mineralization and mining.

At the EMD business meeting of the Eastern Section annual meeting in Evansville, Ind., in October 1980, EMD Executive Committee heard a request for an annual energy minerals development paper to be published in the "World Developments" issue of the AAPG Bulletin. This idea led to the AAPG Bulletin's first publication of separate, comprehensive reports on each of the five commodities under the EMD aegis, i.e., coal, uranium, geothermal energy, oil shale, and tar sands. These summaries were well received and exemplary annual reviews continued until 1990, when AAPG ceased publication of the World Development issue. Principal authors and organizers of these comprehensive papers were:

- Charles G. (Chip) Groat, Sam, Friedman, and Richard W. Jones, coal;
- Carroll F. Knutson and George F. Dana, oil shale;
- John W. Gabelman and W. L. (Bill) Chenoweth, nuclear minerals (uranium);
- Charles W. Berge, J.W. Lund, Jim Combs, D.N. Anderson, and P. Michael Wright, geothermal energy; and
- J.H.N. Wennekers, S.R. Seifert and TR. Lennox, tar sands.

1981 was an important year for EMD in yet another effort to better serve the membership. The bylaws were revised. The EMD structure was changed to emphasize the mineral commodities by adding geographical coverage, paralleling the AAPG organization. Commodity leaders became committee chairs, and Section Councilors were appointed who could network with AAPG Section leaders to plan EMD programs. Also in 1981, the EMD membership first appointed officers and councilors (for 1981-83). Ruffin I. Rackley was appointed vice president of the Division for 1981-1982 and then was elected President the following year in 1983.

The first EMD brochure emphasizing benefits available for joining EMD was published in 1981, initiated by EMD president Frederick Cheerer, in an effort to maintain a rapid increase in EMD membership. The EMD brochure was updated and revised by a committee chaired by Sandra C. Feldman in 1988 and a new brochure was completed for distribution at the annual meeting in Salt Lake City, spearheaded by EMD president Margaret Anne Rogers and Outreach Committee chair Jane McColloch.

Beginning with the first EMD meeting 40 years ago in 1978, a total of 947 oral and poster papers and numerous short courses (or seminars) and field trips have been presented at national and section annual meetings, as well as at special co-sponsored EMD meetings through 1997. A record high of 127 EMD papers were presented in 1980, averaging 47 per year over the next few years. About 47 percent of the papers dealt with geology of coal and coal-bed methane (47 percent), with other papers including uranium, geothermal, and oil shale. These

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commodities were joined by remote sensing as a popular topic for convention papers for the next 10 years. Coal and coal-bed methane dominated papers given in the 1990s through the mid-2000s, especially at the Eastern and Rocky Mountain Section annual meetings.

In March of 1984, EMD reached a high of 2,013 active members. Although only 10-15 percent of the EMD membership attended the national annual meetings, responses to past EMD questionnaires showed that all the members remained interested in all the EMD commodities plus remote sensing with the increasing interest in satellite imagery. During the 1980s, EMD added the gas hydrates commodity as an “unconventional” energy source – increasing the diversity of the commodities represented by EMD.

Coalbed Methane Era

Beginning in the late 1970s interest in tight (low permeability) gas increased with research and development and U.S. wellhead natural gas price incentives spurred by passage of the Natural Gas Policy Act (1978). Interest in coalbed methane started in 1977 with initial development in the San Juan Basin of Colorado and New Mexico, with 91 BCF gas produced during 1989. The EMD commodity chairs continued to produce annual and mid-year reports to reflect the status and utility of each of the commodities monitored.

In the early 1990’s, coal and coalbed methane dominated interest in the EMD as reflected by the percentage of members, conference emphasis (papers and field trips), and publications showing the growth of coal to dominate national fuel production and consumption to drive the electrical power industry. Coalbed methane followed closely.

Certification of coal geologists was initiated in the mid-1990s as the coal industry employed geologists and technicians from other depressed commodities, such as oil shale, geothermal, and conventional oil and gas. Certification added a dimension to EMD and the Division of Professional Affairs with the AAPG House of Delegates at the 1995 Annual Meeting in Denver approved changes in the wording of AAPG Bylaws to enable the Division of Professional Affairs (DPA) to manage this function and associated revenue in cooperation of EMD.



Enforced regulation of all activities affecting the natural environment through the 1990’s required extensive and detailed management of all phases of the resource industries responded. EMD responded by maintaining liaison with the Division of Environmental Geosciences (DEG). EMD and DEG have since benefited from joint technical sessions and luncheons, and plan joint publications for the future. Reciprocally, EMD contributed

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significantly to the health and progress of DEG. Many EMD members were encouraged to join DEG. EMD Active membership was 1,862 as of May 1994, down 61 members from the end of fiscal year 1993 and down 175 from a peak of 2,037 in May 1992 resulting from low conventional oil and gas prices of the 1980s, which persisted into the 1990s. With low prices, unconventional energy resources were even less economic to develop. Alternative energy resources (e.g., coal and uranium) were competing with natural gas in driving the generation of electricity in the U.S.

By the end of the 1990's, EMD held 1,700 Active members who share interests and experience in the science and technology of energy minerals, including:

- * Coalbed Methane, Coal, Geothermal,
- * Oil Sands and Oil Shales,
- * Nuclear Minerals,
- * Gas Hydrates, and
- * Energy Economics.

The New Millennium

With the rise and recognition of the potential value of shale gas and liquids, and with the rise in interest in other unconventional and alternative energy resources monitored by EMD, by the year 2000, the EMD had become the center of technical expertise within the AAPG for all of the unconventional and alternative energy resources. EMD promoted the exchange of information and understanding of new sources of energy through professional meetings, publications and other media. In addition, together with DPA, EMD encouraged professionalism and professional recognition for energy minerals geologists. Dues remained at \$20 per year. EMD's accomplishments after 2000 included a popular EMD program for the New Orleans Annual Meeting, including nine oral and poster sessions and two short courses. Chacko John was the vice chairman for this event, and the EMD luncheon speaker was Charles G. "Chip" Groat, Director of the U.S. Geological Survey and EMD past-president, who spoke on USGS strategies for energy minerals.



The EMD also completed its first year in 2005 as cosponsor of the journal *Natural Resources Research*, published by Plenum Press (now Springer), under the primary sponsorship of the

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International Association for Mathematical Geology, an Associated Society of AAPG. Doug Peters served as the assistant editor of the journal selected by the EMD, working under Daniel F. Merriam. The cooperative initial three-year agreement provided for the EMD to contribute editorial and review expertise, as well as writing and soliciting technical papers for the journal. Later, Peter Warwick continued the relationship with the editors of the Springer Publishing Groups' [*Journal of Natural Resources Research*](#). Since then, EMD has provided a consolidated review of the odd-year annual reports generated by each of the EMD commodity committees. The EMD co-sponsored Journal: [Natural Resources Research](#) has published the bi-annual Unconventional (and Alternative) Energy Resources in: 2017 ([here](#)); 2015 ([more](#)); 2013 ([here](#)); 2011 ([here](#)); 2009 ([here](#)); and 2007 ([here](#)), with earlier periodic papers on various energy-related topics.

Of particular note in 2000, the environmental effects of coalbed methane production and waste-water disposal became a topic of national interest. A federal court in Alabama ruled that fracturing of coal beds was covered under the Safe Drinking Water Act, and must be regulated under the Underground Injection Control program. Fracturing had previously been exempted from the injection rules. A group from EMD worked with the DPA Government Affairs Committee to develop a policy statement which was subsequently approved by the AAPG Executive Committee.

Silver (25th) Anniversary

EMD celebrated its 25th Anniversary in 2002. The EMD emphasized to the AAPG membership that EMD was the center within AAPG for activity on energy minerals and unconventional energy resources. EMD originally focused primarily on coal, uranium (nuclear minerals), geothermal energy, oil shales, and tar sands. However, EMD expanded its focus, and in 2002, EMD's most active unconventional resource areas were coalbed methane, gas hydrates, and unconventional energy economics.

Since inception, EMD membership had remained relatively constant, averaging approximately 1,700 members (active, plus associates, and students), which was very close to the EMD membership in 2002. Although the number of active members dropped below 750 in early 2001, this number bounced back up in 2002 with 830 active members and EMD launched direct communications with AAPG members by e-mail blasts designed to increase EMD memberships. It was noted that one of the biggest changes in EMD membership over those years were the number of international members. International membership grew from about 8% in 1979 to nearly 24% in 2002, and EMD had members in 63 countries.

Shale Gas Revolution

The Gas Shale Committee was added to the EMD in 2004. The EMD web site was moved to the AAPG in 2004 and included a Members-Only section that housed the annual and mid-year leadership meeting reports and commodity bibliographies, web links, and calendars for all EMD members to see.

During the next 5 years, membership numbers fluctuated in response to changing oil and gas prices but EMD continued to offer technical reports and support to AAPG annual and sectional meetings. In 2008, AAPG President Scott Tinker, requested that renewable energy be included in EMD's purview. The EMD Executive Committee discussed forming solar, wind, and biofuels committees to meet this request. During the EMD Mid-Year meeting of November, 2008, Brian Cardott recommended that one inclusive committee be formed in the EMD called the "Renewable Energy Committee" containing sub-committees of the various forms of potential renewable energy resources. This was supported by several members. Mike Wiley suggested that hydropower be included in this committee as well. Creties Jenkins requested that a motion be made to form the EMD Renewable Energy Committee, which was approved by the Executive Committee and reported to the AAPG Executive Committee by EMD President Creties Jenkins.

The following year (2009), as part of EMD's re-newed efforts to improve cooperation between the EMD, DEG, DPA, and AAPG Committees, a joint meeting was held in mid-2009 in Houston of the Executive Committees of all four groups, i.e., representing:

- **EMD** (Frank E. Walles, P.G., then Current President; Creties Jenkins, P.E., P.G., Past President; and Michael D. Campbell, P.G., P.H., President-Elect (2010-2011))
- **DEG** (Michael Jenkins, P.G., then Current President; Rebecca Dodge, P.G., Past President, and Mary Kay Harris, Ph.D., President-Elect (2010-2011))
- **DPA** (Paul W. Britt, P.G., then Current President)
- **AAPG** (Rick Fritz, then AAPG Executive Director)

The main topic was how the three AAPG Divisions and AAPG can work together to develop more joint activities, such as sessions, workshops and short courses. One of the action items was that DEG and DPA were interested in becoming part of the Renewable Energy Committee, with Co-Chairs to handle matters related to EMD and DEG interests. This joint meeting voted unanimously to create a joint Renewable Energy Committee on July 22, 2009.

By the end of 2009, total EMD membership had fallen to about 1,600, due largely to the slump in AAPG membership resulting from declining oil and gas prices. Under the leadership of Presidents Creties Jenkins (2008-2009) and Frank Walles (2009-2010), and with the encouragement of past Presidents and commodity chairs (e.g., Mike Wiley, Michael Campbell,

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Bill Ambrose, and Brian Cardott, and others), new plans were under development to popularize EMD technical products (such as EMD Special Papers, Memoirs, Annual and Mid-Years Report) with all AAPG members. As the oil and gas prices slowly improved, so did AAPG's membership. The membership increase was largely driven by the increased interest in U.S. shale plays in new areas outside of the established Barnett Shale play in the Fort Worth Basin, Texas. Soon "[Boom](#)" conditions sprang up in North Dakota (Bakken), Texas (Eagle Ford), Pennsylvania (Marcellus), and Colorado (Niobrara). Success with horizontal drilling and multi-stage hydraulic fracturing technology in the U.S. increased interest in untested basins around the world, including Canada, Argentina, and China.

The EMD Shale Gas and Liquids Committee, renamed in 2013 from the Gas Shale Committee, was becoming widely known for its state-of-the-science Annual and Mid-Year reports; by association, the other commodity reports and special publications offered by EMD were also becoming popular with AAPG membership.

During the period 2009-2010, EMD made the decision to make available all Annual and Mid-Year Commodity Reports to AAPG members and the general public through the EMD webpage. This allowed EMD to not only meet its primary obligation to the AAPG of informing membership on the technical developments in unconventional and alternative energy resources, but also to advising the general public of these developments and of the state-of-the-science of competing energy resources as well.

Changes were also underway in AAPG during this period. The main AAPG website was redesigned to incorporate the Division of Professional Affairs (DPA), the Division of Environmental Geosciences (DEG), and the Energy Minerals Division (EMD), which meant that the Divisions' websites were all being consolidated within the main AAPG website. This allowed membership greater access to division activities, available publications, and associated reports.

Sensing the new popularity of EMD reports, EMD decided to develop new procedures to simplify membership sign-up by eliminating the EMD \$20 membership fee and creating easy access to EMD reports and publications. After questioning AAPG membership, the EMD Executive Committee decided to enlist the support of the governing AAPG Executive Committee to eliminate the EMD membership fee. This was proposed for the sole purpose of introducing more AAPG members to the



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technical products of the EMD (e.g., commodity reports, short courses, and field trips) without the impediment of having to pay both AAPG and EMD annual dues.

After a period of intense discussions with the AAPG Executive Committee, the “No Dues” feature was approved and announced by EMD in March of 2010. In the meantime, EMD President Michael D. Campbell (2010-2011) took on the task of designing and implementing the new EMD membership procedures for membership sign-up with input from his EMD Executive Committee and associated Commodity and other Committee leadership ([more](#)). These efforts became part of the AAPG website redesign and were announced at the annual meeting. The [EMD Newsletter](#) was replaced by the new EMD webpages section within the AAPG website ([more](#)), and the Treasurer Officer position was combined with the Secretary position in 2017 now that dues were no longer collected.

A sweeping new emphasis was placed on the nine Commodity Committees and the Energy Economics & Technology and Renewable Energy Committees ([more](#)). By the end of 2011, EMD membership [increased significantly](#), driven by new student and associate members ([more](#)). EMD President Michael Campbell summed up the progress in his farewell address to EMD and AAPG ([here](#)).

As reported by Jack Pashin (Chair of the Publications Committee), 2013 was a very important year for EMD publications:

- Alex Papp supported a new version of the Atlas of Coal Geology (AAPG Studies in Geology 42) from design through publication ([More](#)).
- A landmark work on oil sands was edited by EMD’s Past President Fran Hein *et al.* and released as AAPG Studies in Geology 64 ([More](#)).
- A study on gas hydrates was published with The Geological Society of London, Special Publication No. 319 ([More](#)).
- AAPG’s Astrogeological Committee and EMD Memoir 101, “Energy Resources for Human Settlement in the Solar Systems and Earth’s Future in Space” was released ([More](#)) ([9 Chapters](#)).
- The Geological Society of London Special Publication No. 356 on Martian Geomorphology ([More](#)).

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Other AAPG publications that were in the pipeline or released by 2013 related to EMD unconventional resource topics include AAPG Memoirs: [93](#), [97](#), [102](#), [103](#), [105](#), [107](#), [110](#), and [112](#)). Although these memoirs were not directly initiated by the EMD Publications Committee, the proliferation of shale gas and tight oil related publications is a reflection of EMD's success in promoting the education and science of unconventional and alternate energy resources.

Since the changes during 2010 and 2011, EMD continues to produce the Annual and Mid-Year Commodity Committees Reports, and the biannual commodity review in the *Journal of Natural Resources Research*. EMD also continues to promote technical sessions, short courses, and field trips related to unconventional and alternate energy resources for the AAPG Annual Conference and Exhibition and the International Conference and Exhibition meetings.

The Past Five Years

In recent years, the Division has re-doubled its efforts to engage students and the public to educate them on the merits and need for a combination of unconventional and alternate energy resources that will be require the continued efforts of geologists to meet a sustainable energy future with the projected growth in world-wide energy demand. Promoting a sustainable future with a mix environmentally responsible energy resources will require the continued efforts of geologists and related subfields of geophysics, geochemistry, hydrogeology, working together in industry, academia, and government partnerships to support associated research and publications. EMD also encourages its members to publish their research, and continues to explore new outlets to deliver online content in the classical and new open-access international technical journals (e.g., [here](#)).

For the recent history of the EMD, see the following online information:

AAPG listing of EMD ([More](#)).

- A. **Annual President's Reports** ([More](#)).
- B. **The Explorer's EMD Column** ([More](#)).
- C. **Past EMD Officers** ([More](#))
- D. **EMD Reports** ([AAPG Pronouncement](#))
 - Annual Reports ([here](#)),
 - Annual Leadership Meetings ([here](#)),
 - Mid-Year Leadership Meetings ([here](#)), and
 - Executive Committee Minutes ([here](#)).

E. EMD Commodity Committee Web Pages:

consisting of:

- a) Committee Roster (Chairs, Vice-Chairs, Observers, etc),
- b) Resource Summary Details (Special Reports on the Specific Subject),
- c) Activity & Annual and Mid-Year Reports (which identifies members on the Advisory Group, and Special Consultants), and
- d) Other Resources & Links.

Committees on Unconventional Energy Resources:

- a. Coalbed Methane ([here](#)) ([AAPG Wiki](#)),
- b. Gas Hydrates ([here](#))([Explorer](#))([Explorer](#))([Explorer](#))([AAPG Wiki](#)),
- c. Tight Gas Sands ([here](#)),
- d. Bitumen/Heavy Oil ([here](#)) ([AAPG Wiki](#)),
- e. Oil Shale ([here](#)) ([AAPG Wiki](#)), and
- f. Shale Gas & Liquids ([here](#)) ([Explorer](#)) ([AAPG Wiki](#)).

Committees on Alternative Energy Resources:

- g. Coal ([here](#)) ([AAPG Wiki](#)) ([Explorer](#)),
- h. Geothermal Energy ([here](#)) ([Explorer](#))([Explorer](#)),
- i. Uranium - Nuclear & Rare Earths ([here](#))([Explorer](#)) ([AAPG Wiki](#)), and
- j. Renewable Energy ([Hydroelectric](#), [Solar](#), [Wind](#), etc.)

Committee on Energy Economics & Technology ([here](#))

Award Winners over the Years ([Here](#)).

EMD-Related Articles on the AAPG Website ([more](#)).

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