Collected testimonials and well-wishes for

Robert H. Williams

upon his retirement from Princeton University

Updated as of 20 March 2017

Additional contributions to this collection are welcome and will be included in future updates of this document.

Please email all contributions by 1 May 2017 to Eric Larson (elarson@princeton.edu)

The collection as of 1 May 2017 will be bundled for presentation to Bob.
Dear Eric,

I am writing to respond to your invitation on behalf of my father, Marc Ross.

My father now lives in Palo Alto and his health is poor. He won't be able to attend, unfortunately. He sends his best wishes to Bob.

Bob and my father had a very close collaborative relationship. Bob meant a great deal to him and I believe their work together was a highlight of his career. Upon his retirement about 10 years ago my father gave a copy of the book he wrote with Bob to each grandchild. This was, for him, the best symbol of his life-long effort.

Marc C. Ross

Stanford University, February 2017
Wow, congrats on a long and super distinguished career! Send my best.

And “hi” to you Eric, hope all is well with you.

Best,

Mark Delucchi
Research Scientist
Transportation Sustainability Research Center
Institute of Transportation Studies
U. C. Berkeley
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Hi Sarah,

I wanted to provide some remarks for Bob’s retirement party.

Dear Bob,

I learned so much from you about energy systems analysis. Your seminal work on hydrogen, CCS, and biomass plus CCS, to name a few. Your thoughtful and compelling analysis that revealed synergies and co-benefits of different technology options was always an eye opener for me. I look forward to keeping in touch and hearing about your latest ideas.

All the best,

Sally
Hi Sarah,

My quote for Bob is: "Bob is truly an energy sage - an encyclopedia of knowledge, and someone with generous advice and wisdom who was always willing to steer me in the right directions, no matter how many times I kept going off course. He will be missed!"

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Forrest Meggers - Assistant Professor - Director of CHAOS

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Sarah Jackson (sjacks@princeton.edu)

Sarah,

Eric Larson indicated you are collecting messages for the dedication to be given to Bob Williams. Here is mine.

Bob has been an important influence on my career and I am indebted to him as both a source of invaluable facts and predictive models in the energy sector, but equally important as an inspiration for his devotion to solving problems in the energy sector. The duration of his focus on this topic and impact of his technical work has laid a solid foundation upon which we can make smart decisions for our energy future. Personally, I consider him as one of the individuals who influenced me to spend more of my intellectual energy on the real energy problems of our world. I will forever be grateful for the inspiration that he gave me and personal courage to act on it. We need more Jedis like Bob. Through his teachings, knowledge of how to use the “force” for the good of our planet.

Charles

G. Charles Dismukes  
Distinguished Professor  
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Eric,

Please see my written remarks on working with Bob over the years.

Bob was first introduced to me by Rob Socolow, I think, at an early Carbon Mitigation Initiative (CMI) meeting. "This is Bob - you should get to know him!" Perhaps he pushed me toward Bob because of my chemistry training; for a theoretical physicist, Bob had an excellent grasp of the subject. Over the ensuing months, I saw the laser-like intensity of Bob's thinking firsthand, demonstrated by his command of the many chemical transformations necessary to convert fuels into more environmentally benign forms. I saw the intricate AspenPlus chemical engineering models he and others had developed to describe these envisioned plants, and was amazed (and somewhat bewildered) by his depth of knowledge. His understanding of the economics of these systems also became abundantly evident. In addition to his mastery of these disciplines, Bob possessed an understanding of the subtleties of industrial-scale plant operations and how they fit into a larger context.

Bob also displayed a flexibility of thinking that was constantly pushing him "out of the box" of conventional assumptions. This was perhaps best encapsulated by his love of hybrid systems that, for instance, combined coal and biomass feedstocks, or produced hydrogen and electricity as outputs, sometimes with the flexibility to shift between products as market demands changed. These concepts invoked the industrial ecology approach - recycling "waste" from one plant component into useful inputs for another - that was often eclipsed by the more typical atomistic thinking in our disciplines. I still draw upon Bob's style of thinking in my own work.

Bob's interests have spanned many topics in the field of energy over the years, including nuclear power, energy efficiency, carbon sequestration, hydrogen, low-carbon fuels, renewable electricity, and electricity storage. He said he liked to apply himself intensively to a new question or idea that had been overlooked by others, and write the first, usually defining, paper in that discipline. After others had been drawn into the field, he would tend to move onto other interesting topics. In this way, his influence has been felt broadly across many disciplines.

Probably the most transformative moment in my time at Princeton - and perhaps in my career, for it represented a pivotal shift in my professional research direction - was when I walked into Bob's office one day, after months of frustrated reading and thinking about how to solve the climate problem, and asked him why we seemed "stuck" with an inefficient, polluting energy system despite the availability of clean choices like wind power. After a pause, he smiled and said, "I've got a project for you." Thus began a two-year apprenticeship of sorts, which also pulled in two other young researchers (Samir Succar and David Denkenberger) that transformed all of our thinking about wind power, electricity storage, and how it could compete with fossil fuel combustion.
As I got to know Bob better, I began traveling with him to conferences and speaking engagements, and glimpsed the political alliance-building side of him, at which he was equally adept. I remember my head spinning with a web of unfamiliar influential names after dinner one night, as Bob told me of his plans to unite the coal, oil, agricultural and automotive communities together to create a brighter future. It was exciting to be made a part of this, though I was too naive at the time to understand the enormity of what he was attempting to take on. Ultimately, that particular plan did not pan out, as many players and events evolved in ways that were, of course, out of his control, but the boldness of Bob's attempt to realize this vision stayed with me.

Once I left Princeton to make my own career in the world, Bob's name often came up in unlikely contexts, and I was made aware of the far reach of his influence, both in terms of his visionary thinking and the number of people who were familiar with him and his work. I began to understand how Bob's long career had touched many other people when they were young like me, who subsequently applied some version of his thinking to their own work, always with a grateful remembrance of who had helped them to get there. While it may not seem so in our current state of political turmoil, I believe the world is in a better place, with more energy system options available to it to combat climate change, because of Bob Williams' contributions. We, as recipients of his influence, owe it to the world to continue his work and pass on what we've learned to the next generation.

Thank you, Bob, for your years of service to humanity!

Jeff Greenblatt
From: M. V. Ramana  
Sent: Tuesday, February 28, 2017 12:04 AM  
To: Sarah E. Jackson <sjacks@exchange.Princeton.EDU>  
Cc: Eric D. Larson <elarson@exchange.Princeton.EDU>  
Subject: Re: Bob Williams is retiring

Dear Sarah,

I will be attending the symposium and I do have a short memory of Bob that I would like to share.

When I first came to Princeton in 1997, Frank had asked Bob to give me and Zia a presentation on energy issues of relevance to India and Pakistan. What struck me about the presentation was that Bob had the thickest wad of transparencies for the overhead projector (these were the old days, before power point became popular), that he showed us one after the other. At some point, I asked him something about the status of solar photovoltaics. Whereupon Bob dug into his bag and produced another thick wad of transparencies on solar PV technology. On top of all this, I also remember being impressed with the fact that Bob answered any questions in complete sentences, with no fumbling or searching for words.

Best wishes,

Ramana
Eric

Bob has been a stalwart in his field for the three decades that I have worked at Harvard and has earned the respect of all of us working in the energy space. I am delighted that Princeton is honoring him.

Best

Henry
Hi Sarah,

I will not be able to attend the event but would like to include a note for Bob.

Retirement is such “sweet sorrow”. It is nice to sleep late and read all the books you have always wanted to read but not having contact with friends and colleagues you have made over the years is the sorrowful part. Bob was full of energy and always ready to take the time to explain his latest idea. That was one of my favorite things to do when I visited Princeton. I always found Bob’s ideas well thought out and built on many years of sound engineering work. The field will miss him as will I.

Regards,

Charles Christopher

(713) 502-3008 Cell

(512) 712-5673 Home
Dear Eric,

Thanks very much for your emails and for bringing the news. It's been such a long time. Trust all is well with you and family and the research group in ACEE.

This is an amazing occasion to celebrate Bob's remarkable career over four decades. As a practitioner in development, I have witnessed the influence of Bob's cutting-edge thinking of clean energy solutions in the real world, including my own work at the World Bank in helping the developing countries embark on a sustainable energy path and bring electricity services to all. His guidance and insistence on critical thinking served me well during the my PhD years and thereafter. I still remember the wonderful Thanksgiving dinner at his home and "mandatory" neighborhood walk before the desserts 17 years ago.

I moved to Thailand two years ago and will regretfully miss the symposium. Please send my best regards and wishes to Bob.

Best regards,

Xiaoping

P.S. I apologize for not being able to reply earlier. These days I travel a lot in rural areas of Myanmar to get 6 million people electrified in the next 5 years.
Bob is so talented and kind and I always feel proud that I know him.

Rajeshri Chokshi
Princeton Environmental Institute
March 2017
Hello Eric

I will be in Paris thus not able to attend

Please send my "warm regards and congratulations" to Bob

Working with him was always a pleasure.

He was always challenging the way I was thinking in a constructive manner.

I will keep fond memories of working with him

Benjamin

----------------------------------------------
Benjamin Court Ph.D.

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Sarah, greetings.

Attached is some thoughts I have about Bob Williams. I was a postdoc with Bob and Eric in 1998-1999, and later collaborated with them in 2001-2005.

Regards.

Haiming Jin, Ph.D.
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It was a great fortune and honor for me having the opportunity of working abreast with Dr. Bob Williams when I was a postdoc at Princeton in 1998. I was deeply impressed by Bob’s consistent dedication to work with all-rounded attention to details. On the Christmas Eve that year, Bob was polishing a PowerPoint presentation for a conference in Beijing. In despite of his tight daily schedule, he still worked until odd hours weeding out all the typos and inaccurate expressions. This shows the high standards and passion Bob kneaded into his profession and his empathy toward his audience. I was there burning midnight oil with him and surely he turned into my role model.

Bob is very humble in nature and mocked himself on a few occasions that he was quite incompetent at managing people. In reality, Bob is a man of words. He is not only an ace communicator, but also an exceptional action taker leading by example. Bob is my teacher, my friend and more importantly my inspiration in the past, in the present and in the years to come. Thank you, Bob.

Haiming Jin, Ph.D.
President of Jinnovation Inc.
Dear Eric,

Ottmar would like to ask you to include this note in whatever format you have chosen for the contributions:

*It is both a great pleasure and honor to celebrate with Bob on the occasion of his retirement. I was also delighted being able to contribute to the symposium as a tribute to Bob’s life work. All best wishes to a great colleague, a very knowledgeable expert and an enthusiastic promoter for a sustainable energy supply.*

Best wishes,
Susanne (for Ottmar Edenhofer)
Dear Bob:

You are my model for quiet but confident optimism. Over the years I came to understand its source: You are able to turn every challenge into an opportunity.

Thank you for giving me so many thoughts and ideas.

I wish you many happy years along the Front Range!

Sigurd.
From: Jose Goldemberg [mailto:jgoldemb@gmail.com]
Sent: Wednesday, March 8, 2017 3:32 PM
To: Eric D. Larson <elarson@exchange.Princeton.EDU>
Cc: goldemb@iee.usp.br; Robert H. Williams <rwilliam@exchange.Princeton.EDU>; Robert H. Socolow <socolow@exchange.Princeton.EDU>; Sarah E. Jackson <sjacks@exchange.Princeton.EDU>; Caitlin M. Daley <cdreyer@exchange.Princeton.EDU>; Kristina K. Corvin <kcorvin@exchange.Princeton.EDU>; Holly P. Welles <hwelles@exchange.Princeton.EDU>; Presidencia <presidencia@fapesp.br>
Subject: Re: Can Jose take part in Bob Williams's Retirement Symposium

Dear Eric

Thanks for the E-mail regarding my participation in Bob’s retirement symposium. Unfortunately, I cannot be present (among other things because I am 88 years old!) but will contribute alone the lines you proposed.

1. Please leave my name in the Program. My thoughts on the carbon mitigation problem that Rob might want to mention in the panel are outlined in Annex I
2. Some thoughts on Bob’s careers to be mentioned in the diner are in Annex II
3. CV and photo are also attached (Annex III and photo in .jpg)

Truly yours,
Jose

Thoughts on the significance of Bob's work

José Goldemberg, March 2017

It is generally accepted that the 1986 book by the “Gang of Four”

is a landmark of energy analysis. Among other things, the book clearly articulated the ideas of sustainability that were later incorporated in the 1987 Brundtland Commission Report on sustainable development (Our Common Future).

Bob's unlimited capacity of work and competence shaped the main messages of the book, which are:
- The fundamental importance of energy efficiency and advanced technologies from the industrialized world, of which Bob was at the time the undisputed leader due to his previous work with the Ford Foundation’s Energy Policy Project;
- Technological leapfrogging as the key strategy for development in developing countries.

The authors of the book were listed alphabetically, which really didn’t do justice to the key significance of Bob's contributions to the work.
Hi Sarah and Eric,

Below are my thoughts and recollections of Bob Williams for his upcoming retirement celebration. It will be an interesting and important event!

Best Wishes,

Laura

As a graduate student in Princeton’s Center for Energy and the Environment from 1994-1997, I was inspired by Bob’s visionary ideas and his enthusiasm for “putting all the pieces together” to show how to transform his visions into reality. It was from Bob that I first heard of:

- Carbon sequestration (which is now being implemented around the world)
- Powering a house with a fuel cell vehicle (some fuel cell vehicles now offer this, such as the Toyota Marai in Japan)
- The viability and high mileage capability of commercially-available hybrid gasoline-electric vehicles (which are ubiquitous now)

Bob’s ideas and analysis supported a “can-do” approach that has helped pave the way for implementation of novel energy and emissions strategies in the last few decades.

Laura Iwan *97
MSE, Princeton University
Senior Systems Engineer, Automotive Fuel Cell Cooperation Corp.
Burnaby, British Columbia, Canada
Dear Sarah,

Please find attached a short note for Bob's retirement. I will also try to look up some old pictures and scan one of those (if the quality is sufficient).

Please do not hesitate to contact me in case of any queries.

Thank you.

Take care,

Ernst Worrell

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Dear Bob,

Retirement….. I never imagined you as being retired, and I bet you will continue to remain active in the work needed to help save the planet. I am sorry that I cannot be personally in Princeton to give you my best wishes. It has been a while since we last have seen each other; a lot has happened since. Yet, my year as post-doc working with you in Princeton seems like yesterday. Having worked with you during your visits in Utrecht, on my PhD committee, the move to Princeton was the best opportunity to keep working together. I remember your drive, your energy, the nights to prepare for testimony in Congress, but also Thanksgiving with your family. You gave me a lot of freedom working at the Center in Princeton, and I was blessed with people like you, Eric, Rob, and also the other post-doc’s Sivan, Debbie, Lars, Kelly and the others there.

I also fondly remember the great atmosphere at the Center, the openness to discuss so many issues, and to explore new research directions. Only a few months ago, I was reminded how far ahead we were in some of our research, as I ran into a researcher here in The Netherlands that was looking at using metals to store energy. A very explorative study by us on using iron oxide to “store” hydrogen turned out to be 20 years ahead of its time. The work on waste gasification was also ahead of its time, as it keeps popping up around the world. The unique atmosphere of the Center, the unique people, the inspiring campus, all were the ingredients that made this possible.

Personally, it was also a great year for me, as it really has been the start of my international career, as I returned to the United States only a few years later, to spend 7 years on the other coast of the country. While, I am now back at Utrecht University as a full professor, I still see your drive and energy, the opportunity to work with you, as the exciting first steps in my career as (a then....) young scientist. The contacts made in that year are still going strong. I am in regular contact with Debbie and Lars, and we work even on exciting projects together.

Bob, I hope that you look back fondly at your contributions to the Center and the world. You have made an impact in this big world, and you have helped to grow the next generation energy scientists. People that are now having an impact in this world, and help grow the next generation once again.

Thank you for all the opportunities you offered, and most importantly the one to work with you directly. I wish you the best of luck with your first steps in this new phase in your life. I hope that you and your family can now also visit those places that have provided fond memories for you all and those places that you want to visit together. Enjoy this new phase, and also keep up the good work!

Ernst Worrell

Utrecht, March 10th, 2017
Dear Sarah,

I was given your contact by Dr. Eric Larson so that I could pass on my comments about Dr. Williams on his retirement.

I first met Bob (and Eric) when we were all three working for the China Council for International Cooperation on the Environment and Development, in China, on the Energy Working Group which was tasked with helping the Chinese government to plan its energy development for the following 50 years. I was Chairman of Shell North East Asia at the time (based in Beijing, where I was chairman of Shell China) and was involved for about 5 years in total with this initiative.

I must say that we, with tremendously valuable input from Bob and Eric and Princeton University and others, developed some very good ideas, with widespread use of clean coal technologies and coal gasification being key components of what we proposed to the government.

However in the end China didn't follow through with much of our advice, though warned of the consequences, and we now see the results in the very high levels of air and soil pollution in China today. The switch now to cleaner energy production systems is obviously very costly indeed.

I remember the Chinese Premier, Zhu Rongji, telling us at one of our meetings with him that China would not contemplate taking the more expensive route to energy production that we were proposing until the country had developed to the level of a GDP/capita of USD4,000! In fact the very additional high existential costs involved in their proposed development plan at the time were clearly outlined in our report.

I was very much impressed by Bob's and Eric's technical advice on the key issues we studied, together with our colleagues in the Council from Tsinghua University, and I will remember Bob very warmly for his very professional input. I wish him a very happy and productive retirement!

Best regards,

Brian Anderson

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Hi Sarah,
This is Guangjian. I worked as postdoc in Princeton University with Eric Larson, Tom Kreutz and Bob Williams from 2008 to 2010.
I got news from Eric that there would be a public symposium for Bob’s retirement in April.
Unfortunately, I can’t attend.
As Eric suggested, I wrote a short letter to Bob to express my best wishes. Please check the attachment.
Thanks and with best regards,
-Guangjian

Dear Bob,

  I miss the wonderful time when I worked at Princeton University with Eric, Tom and you, not only because I stepped into fascinating energy systems studies, but also because I benefitted from observing the spirit of your daily life.

  First, you are forever curious about new things in your research field. I was surprised and inspired by your enthusiasm in energy systems studies, including every branch of energy -- energy economics, energy policy, thermodynamics, etc. You read and work voraciously -- like a young student! After not so long a time, you know much more about energy systems than most other researchers. Maybe that’s the secret of your successful career.

  Second, you are dedicated to finding success. I have read every milestone paper in your publication list. The complex, elegant papers tell people good stories about energy systems. Your 1978 paper on ‘Industrial Cogeneration’ published in Annual Review of Energy was the starting point of polygeneration energy systems studies, which you have now worked on for almost 40 years. Now more and more people, including Chinese researchers and entrepreneurs, have embraced your idea. It’s really exciting and a true mark of success for a researcher. You have set a good example for me.

  Last, but not least, you are always nice to your closest friends. You know, Chinese people are silent or subtle when it comes to emotional expression. They usually do not say love to their relatives. Sometimes they criticize their closest friends without a second thought. But I saw how respectful and sweet the relationship is between you and Elinor. I will never forget the kindness that both of you showed to Huimin and Xiang. You let me know that love is power.

  Now, since you have chosen retirement, I send you my best wishes for slow and peaceful years ahead.

Yours sincerely,
Guangjian
March, 14, 201
Hi Eric,

Thank you very much for your invitation. Unfortunately, I will be out of town. Here are my thoughts about Bob.

It was so long ago when I worked for Bob and Frank Von Hippel. My memory of Bob is that he kept revising his chapter that he wrote with Profs. Amulya Reddy and Thomas Johansson.

In those days, I had to walk over to Stanhope Hall to send his messages by telex. He was quite absent-minded, but you couldn’t rely on it. One day, I drove him, Eric and Joan Ogden to the airport, and on the way, I casually asked if they had their passports for the trip to Jamaica. Joan said “no”. So, I dropped Bob and Eric off at the airport and took Joan back to Princeton. But Bob had his passport and he made the flight.

Bob was so passionate about his research on biomass. Bob, Congratulations on your retirement. You were ahead of your time in your research for renewable energy.

Kim
Thanks to my good wife -- and her dexterity with our computer -- I am delighted to send you herewith the two-pager, "small cars."

This is one of 152 stories in my book, *Surprise Encounters with Artists and Scientists, Whales and Other Living Things*, p. 321.

In lively anticipation of the big day.

Scott & Hella

**small cars**

In 1956, I bought a beige Volkswagen in Berlin to allow ready travel about the three western sectors of the city, the French, the British, and the American. This purchase was made possible through a generous loan from my father, who forgave the loan upon the occasion of Hella's and my marriage on August 9, 1958.

For another seven years, Hella and I drove that beloved vehicle in Berlin and in this country right up to the time I had pieced together $1500 to buy a new VW in 1963.

Then I spied an ad in our local weekly, *Town Topics*, which listed a “mint condition” Mercedes with red leather seat covers for the same sum. We bought it, and when I rolled into our local gas station, three guys were all over it, polishing the windows, the head lamps, even the side mirrors – things I had done myself.

Fast forward. Here in Princeton is a physicist, Robert H. Williams (BS in physics at Yale, 1962, PhD in theoretical plasma physics, Berkeley, 1967), who is an authority on various forms of energy. He has written and co-written books and papers on many facets of the energy field and has been a consultant to China since 1991. In 1993, he received a MacArthur Fellowship, often referred to as a “genius” award.

James Ferland, for many years CEO, president, and chairman of PSE&G (1986-2004), was knowledgeable about all applied aspects of energy. He said he would like to meet Williams, perhaps over dinner since he was constantly being interrupted at work.

I arranged a dinner in Morristown in the mid-1990s and was the proverbial fly-on-the-wall when the two of them interacted for more than two hours touching on every aspect of the field from coal to oil to natural gas to wind to sun to geothermal to nuclear.

Some time later, P. Roy Vagelos, then CEO and chairman of Merck and author of 100 scientific papers, said he’d like to talk to Williams. Vagelos said energy was wholly outside his field, but he had heard from Ferland that he had enjoyed meeting with Williams.
I arranged for a meeting at Merck’s headquarters in Rahway (before the move to Elysian Fields in Whitehouse Station). Bob and I traveled from Princeton to Rahway in his Honda Civic which got 60 miles to a gallon of gas.

When we arrived at the gate, I cranked down the window. The security guard asked what we wanted.
“Where might we park the car?” I asked.

He replied, “Go to the end of this lot and then proceed to the back of the second lot, and you will find a third lot. Park at the back of the third lot.”

We hoofed it back to the gate. The guard said, “What do you want now?”
“Could you please advise us where Mr. Vagelos’ office is?” He blanched and pointed the way.

Moral: In our society we tend to judge somebody by the size and status of his car.
Dear Eric,

Below are some of my reminiscences on Bob, you, and my early days at Princeton.

———

It may be said that great men change the course of history. Well, I can certainly say that Bob Williams changed the course of my history. I first met Bob when, as an undergraduate in São Paulo, I went to work with Diomedes Christodoulou, who had been a former master’s student at Princeton, and was now working with the local energy company on a variety of energy assessment issues. I ended up writing up my undergraduate thesis on the technical and economic feasibility of transporting biogas from the many alcohol distilleries for cogeneration. Bob had been working on the subject for a while, and came to visit. I loved the idea of being able to take forward these ideas, and was very enthusiastic about working with Bob’s group at Princeton. Bob, Eric Larson, Joan Ogden and Rob Socolow were incredibly welcoming, and the center was always a hub of interesting people. Bob was a great mentor, always respectful and enthusiastic about unconventional paths.

This great experience really sold me on becoming a researcher for life. I eventually had to find out why such great ideas were not being put into practice, and veered into the more technical aspects of energy transformation as the career went onwards. But I never forgot the really great start I had, the idealistic bunch we all were, and hopefully all still are.

I made life long friends at the center, met my husband at Princeton, and lived happily ever after... so here is to Bob, who made it all possible.

———

Professor Simone Hochgreb
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http://www-g.eng.cam.ac.uk/reactingflows
Hello Eric,

Looks like an amazing symposium. I hope you tape the policy discussion at the close so that we who cannot attend in person can all hear it and find a spark of hope.

What always struck me about Bob was his dedication to the principal that good science should be a foundation for good public policy. He is not alone but he was the most enthusiastic proponent I have ever met and ardent in his efforts to inform policy makers. I wish him well as he carries on with that battle!

Maybe we will see him at the March for Science in WDC in April.

Best Wishes,

Edward E. Gray, P.E.
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In order to properly understand the significance of Bob Williams contributions to our understanding of energy issues and their central place in so many domestic and global affairs, some historical context is required. Fortunately, being (almost) as old as Bob, I have some recollection of this long-ago era. In 1984, I joined the newly formed World Resources Institute assigned to work on energy and climate issues. Oil prices were low, climate change was not on the agenda for any national environmental group, energy for development meant building power plants burning fossil fuels, and the NGO where I had been working decided clean energy was “a California issue” and consequently that I should work on more serious environmental issues -- like air and water pollution.

Among my first assignments was to help Bob and his international collaborators – widely referred to as “the Gang of Four” – to produce a shorter and less technical version of their seminal work *Energy for a Sustainable World*. Once Bob accepted that I was there to help and not to argue with him, we became friends in relatively short order. And in retrospect, what an extraordinary and influential body of work it was, the fundamental principles for a set of beliefs about the energy system and development that have come to dominate virtually every domain of energy planning and policy this side of OPEC and (what’s left of) the coal industry.

As I know there are many others who will comment on this body of work in some detail, I will only say what a great honor – and influence it was for me personally – to have some early insight into this brilliant, far-sighted, and under-appreciated man.

Alan Miller
From: Baxley, J. Steven [mailto:JSBAXLEY@SOUTHERNCO.COM]
Sent: Thursday, March 16, 2017 4:36 PM
To: Eric D. Larson <elarson@exchange.Princeton.EDU>
Cc: Sarah E. Jackson <sjacks@exchange.Princeton.EDU>
Subject: RE: Follow-up/friendly reminder

Eric,

With regrets a prior commitment will prevent me from attending the symposium in honor of Bob Williams’ retirement. Sounds like great event and best wishes to Bob on his retirement.

Regards,

Steve Baxley, PE

Manager- Renewables, Storage, and Distributed Generation R&D

Southern Company | Research and Environmental Affairs

Phone: 205.257.7608 | Cell: 205.910.5225 | E: jsbaxley@southernco.com

Southern Company
Hi Eric

Attached is my note of appreciation of Bob.

Best regards, Gordon

An Appreciation of Robert Williams
by Gordon Thompson
<gthompson@irss-usa.org>

16 March 2017

I came to know Bob Williams while working at Princeton in 1979 and 1980. Since then I have had the pleasure of intersecting with Bob on various occasions, and of following his work at a distance.

In the personal sphere, Bob and Elinor Williams have been remarkably generous in opening their Princeton home to visitors and colleagues. I have fond memories of dinners and other events they graciously hosted. They have provided a refuge from the tribulations of the energy/environment policy arena.

In the professional sphere, Bob has been a role model for me and for many others. By relentlessly examining a range of issues regarding energy and the environment, Bob has made important contributions to creating the technical basis for a sustainable civilization. Moreover, in making those contributions, Bob has maintained the highest standards of transparency and accountability. Where others might be tempted to hide an analytic assumption, Bob puts it on display.

Bob has a healthy ego. Yet, he is always ready to explain an issue, or to encourage work by others. Above all, there is never any doubt that Bob is committed to serving the public interest.

Thank you, Bob, for your work and your example.
Dear Eric and Sarah
Please, see my note about Bob Williams.
I will not be at the ceremony, unfortunately.
Thanks
Jose Moreira

Dear Bob Williams
Considering your retirement from the Princeton University, I believe it is a nice opportunity to talk about your strong ties with Brazil, mainly due your interest in renewable biomass-based energy.

As old as 1984 I was introduced to your ideas about biomass gasification and the use of the gas as a fuel for combined cycle gas turbines. Your initial calculation anticipate a generation potential of more than 300 kWh per tonne of cane, in a moment when average electricity generation on sugar mills were around 40 kWh.

The proposed technology has not yet achieved commercial application but the sugar cane potential to generate increased amounts of electricity was object of many political and technological meetings, involving people from the academy, government and entrepreneurs. Through the leading of Jose Goldemberg, your initial idea has yielded commercial results. Nowadays, some sugar mills are exporting 140 kWh/tcane, on top of using in the ethanol producing processes 40 kWh/tcane.
Furthermore, these units run year round, since during the 7 months of the harvest season they are able to save sugar cane residues to operate during the non-harvest period at full electric power.

During 2016, some 35 TWh has been sold by sugar mills, still a modest value, since only 50% of the mills are selling electricity to the grid, and from these, more than half are below the performance above described. As bioelectricity gains space, considering the availability of 700 Million tonnes of sugar cane the potential production could reach 98 TWh/yr, without further technology progress. This represents today 1/6 of total Brazil’s electricity generation. You have initially driven such result.

With the IPCC, your participation has been extremely useful during my activity in the preparation of the report Carbon Dioxide Capture and Storage, during 2004/05, when for the first time we presented the concept of BECCS (Bioenergy Carbon Capture and Storage) to the Panel. The achievement required many discussion since the initial purpose of the report was to, essentially, analyze CCS from fossil fuels.

Due the evolution of our contact, we had other opportunities to sell new ideas to Petrobras, considering zero CO2 emission. No fruit has already shown but the discussion proceeds.

Dear Bob, I am sure that your contribution has influenced colleagues in other countries, and what I am reporting here is just a small share of your significant help to the progress of science. Furthermore, knowing you so well, I can anticipate that new ideas will continue to flow from your mind and science will continue to be pushed by you.

Regards,
Jose Roberto Moreira
Senior Professor
Institute of Energy and Environment
University of Sao Paulo, Sao Paulo, Brazil
Dear Sarah,

Here attached please find my note to Bob.

Best wishes,

zheng

Prof. Zheng Li
Dean, Department of Thermal Engineering
Director, Tsinghua BP Clean Energy Research and Education Center
Tsinghua University
Beijing 100084, China

Dear Bob,

It is a great pity that I can’t join your retirement symposium for reasons I can’t control. I apologize. Instead, I’d like to write a few words to express our appreciation for your great contribution to China. You are one of the first people to propose the concept of “polygeneration” to China, and it has been accepted and practiced as an important solution for sustainable energy development in China. Your name is tightly bonded to this great idea! I thank you also for mentoring me in many aspects. The book—“Pasteur’s Quadrant”—you presented to me enlightens me so much and has great influence on my later career. At the moment you are going to retire, I just want to show my respect to your wonderful professional career and wish great enjoyment in your retired life, although I am quite sure that you won’t go away from the research you love. I am happy to keep contact with you in the future.

Best wishes!

Zheng

Prof. Zheng Li
Dean, Department of Thermal Engineering
Director, Tsinghua BP Clean Energy Research and Education Center
Tsinghua University
Beijing 100084, China
Hi Eric,

Here is a short note -- I hope it is fine!

Bob is retiring from Princeton today -- However, never expect Bob to stop generating new ideas to save the world! I believe you will continue to find Bob's name in research papers!

best,

Zhong
Hi Eric,

Sorry to be late. If possible, I’d still like to add my note for Bob’s memory board:

"Dear Bob,

I will never forget your illuminating work on the real opportunities and real costs of changing the energy system. You have made a big difference in how I and many others think about energy.

With best wishes for your next stage of endeavors,

Ellen"

Kind regards,

Ellen

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