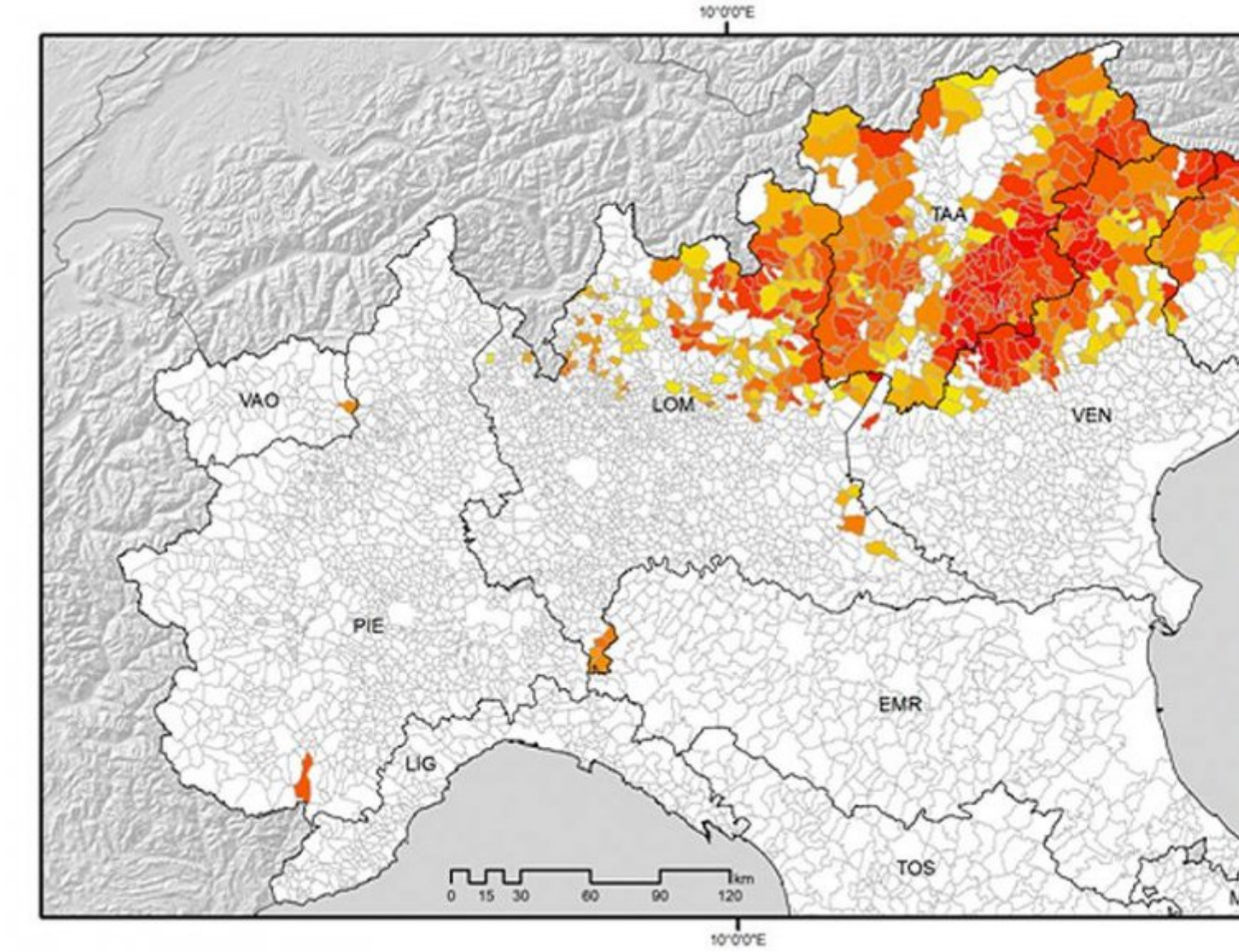
FONDAZIONE BRUNO KESSLER
MAGAZINE

Why we should learn more on hydrogen and other alternative energy sources

September 25, 2019

Ruben Bartali, a researcher with the Center for Materials and Microsystems at Fondazione Bruno Kessler, talks with Federica Vinci from Volt Italia about sustainability and "national energy sovereignty" at the Festival of university students of Trento: Poplar

The urgency of an adequate international initiative against climate change, and the inadequacy of what has been done so far, has emerged with increasing force especially in the last year, thanks to the mobilization of young people from many countries in the footsteps of teenage activist Greta Thunberg, in hundreds of cities with the Fridays for future movement, and with other movements – mainly youth movements – of similar inspiration. In Trentino, we saw first-hand the local effects of climate change and how they can hit hard with storm Vaia, the disastrous event that struck the Triveneto area and its mountains at the end of October 2018, downing over ten million cubic meters of trees.



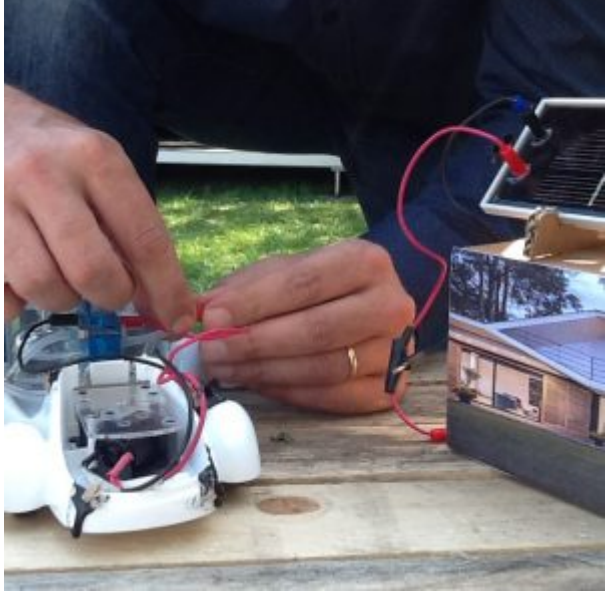
So climate change, its effects and its causes are back at the center of public debate: if during the first decade of 2000, the debate focused on the Kyoto Protocols and the role of countries, today Greta Thunberg and the environmental movement, led by young people and women, is revolutionizing the vocabulary and perspective with which we address this topic. As far as the Trentino area is concerned, sensitivity toward the environment is part of the local identity and can be seen for instance in the practices that for centuries have allowed the management and enhancement of forests. But there's more.

As evidence of the high attention society is paying to this issue, in September of last year a group of experts dealing in various ways with environmental issues and climate change had launched a 10-point appeal targeting candidates running in the Trentino provincial elections of October 21, 2018.Back to the present, the Poplar festival was held in Trento in the same week of the world climate strike (Friday, September 20, 2019). In its third edition this year, the event is organized by the local university student associations with hundreds of volunteer students involved. The event saw the participation of thousands of youths and offered a rich artistic and cultural program. In particular, as part of the "Cult" afternoon section, local and national experts were invited to talk about current issues. One of those talks was "Is there a sustainable future?", held on Saturday,September 21 with the participation of Federica Vinci, President of the pan-European

political party Volt Italia, and Ruben Bartali, a researcher with the Center for Materials and Micro e intent of the organizers was to interpret the phenc ion, alternating political and scientific views.





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A pretty rosy scenario emerged as far as the Italian energy situation is concerned, especially with reference to the Trentino area, particularly rich in hydroelectric sources. The FBK researcher stressed that the national energy transition represents a great opportunity as long as the country as a whole is able to **invest primarily in research and education**: even from this point of view we urgently need to equip ourselves with the necessary skills to avoid undergoing this change, interpreting its knowledge challenges in the best possible way. Bartali is part of the **ARES** team, which **promotes research and development on new energy solutions and aims to transfer them to the market by collaborating with industrial and local partners**.

To set us thinking, he began with a surprising request: we should remain silent for a few moments. After 10 seconds he told us that the elapsed time had been enough to gather all the energy needed to satisfy most of our region's demand. We then talked about the crucial role of energy not only to steer the transition to green economy but also to lay the foundations for the sustainable development of our society as a whole. Energy is a fundamental evolutionary element for our ecosystem and involves social and technological innovation. Pursuing a greater use of alternative energy sources entails more complex systems and implies an adequate re-planning effort to change energy distribution networks since there will be many sources to be hold together efficiently. So, the challenge consists in integrating old and new sources, exploring ways to adjust consumption and to build up energy. Thermal energy storage and vectors such as batteries and hydrogen technologies can help us a lot on this front. With regard to the hydrogen vector, to prove that "it can be done", the researcher brought along a scale model of a hydrogen powered car that collected solar energy thanks to a photovoltaic panel for the entire length of the meeting. By separating oxygen from hydrogen, the energy collected this way was enough to make the car move.

What are the Pros and Cons? The advantage of hydrogen is in its high energy density but at the same time it has a "small flaw": it is the most explosive gas. Today, safety risks are addressed through the development of safe fueling stations and costs are increasingly becoming more acceptable. In other words, we need to look at the phenomenon in perspective and also steer the public debate towards the formation of informed opinions. Interest in environmental issues compresses or expands depending on the cultural climate. Words that label the same phenomena

change over time because different labels suggest different connotations. **Take, for instance, the emblematic case of “global warming” converted into “climate change” by the pressure exerted on the media by the George W. Bush administration** at the beginning of the millennium. The words we choose entail an ability to look ahead or impose an immobility that stops at the present or immediate future. As if, given the fragility of increasingly liquid political systems, we were no longer able to plan multi-year efforts to tackle complex challenges. If we think about it, each of us, in our private lives, do the exact opposite thing when buying a house or thinking about what family choices we make for the growth of our children.

Events such as the Poplar festival therefore help to reflect by listening to different opinions and training our gaze to make room for a project mentality despite the catastrophe narrative and to find the right arguments to motivate people to act. Although we cannot know what future awaits us, we are able to project the present trends in which we live and predict which scenarios await us. In any case, between a pessimistic scenario and an optimistic one, it will be people who will make the difference, this is why it is critical to invest in knowledge to lay the foundations today for the least worst possible future, the best future we can build together with our daily work.

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